JANUARY 1957

GAS

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A special market report.

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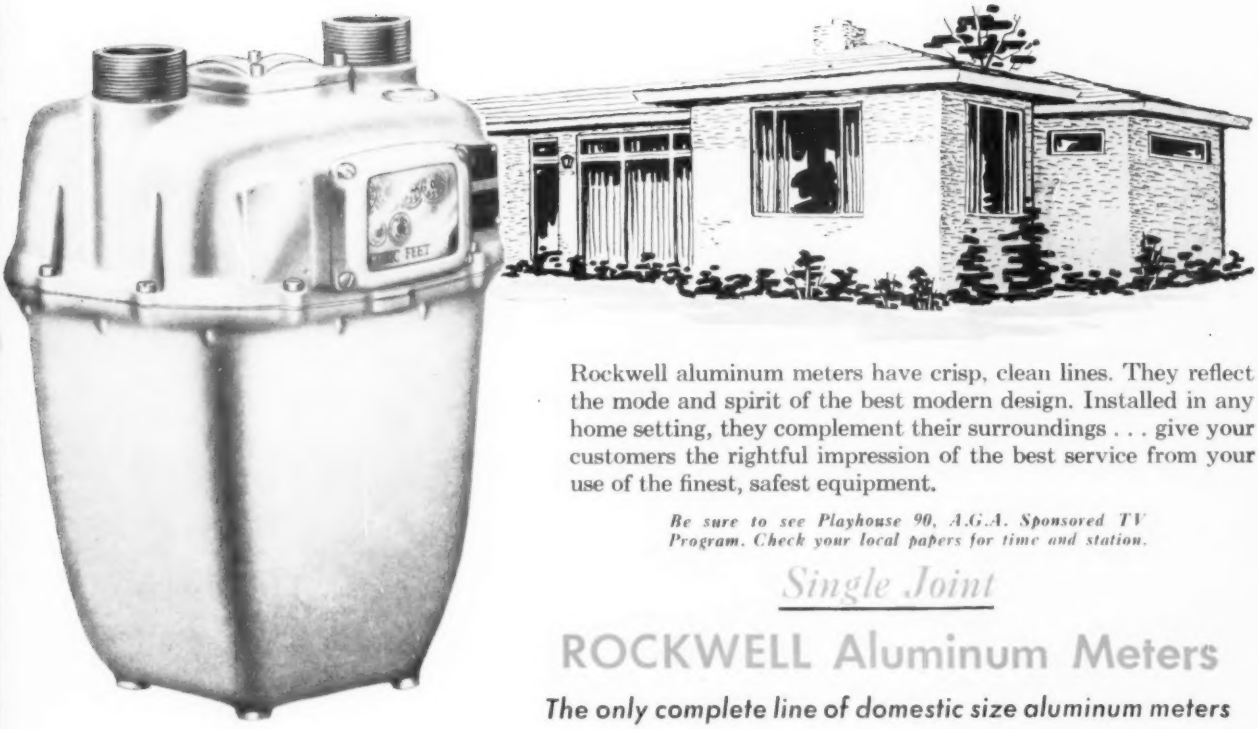

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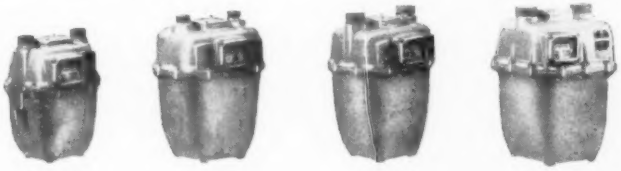

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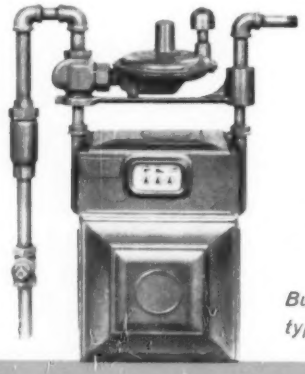

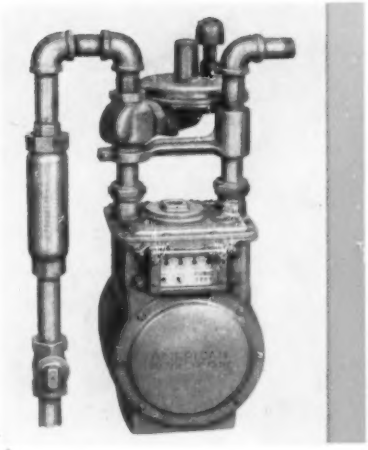

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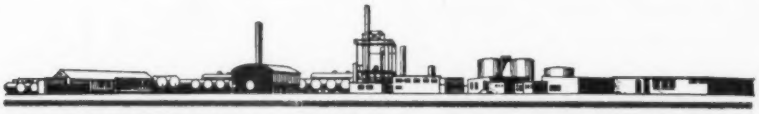

NATURAL GAS ODORIZING

Division of Cue Fastener Corporation

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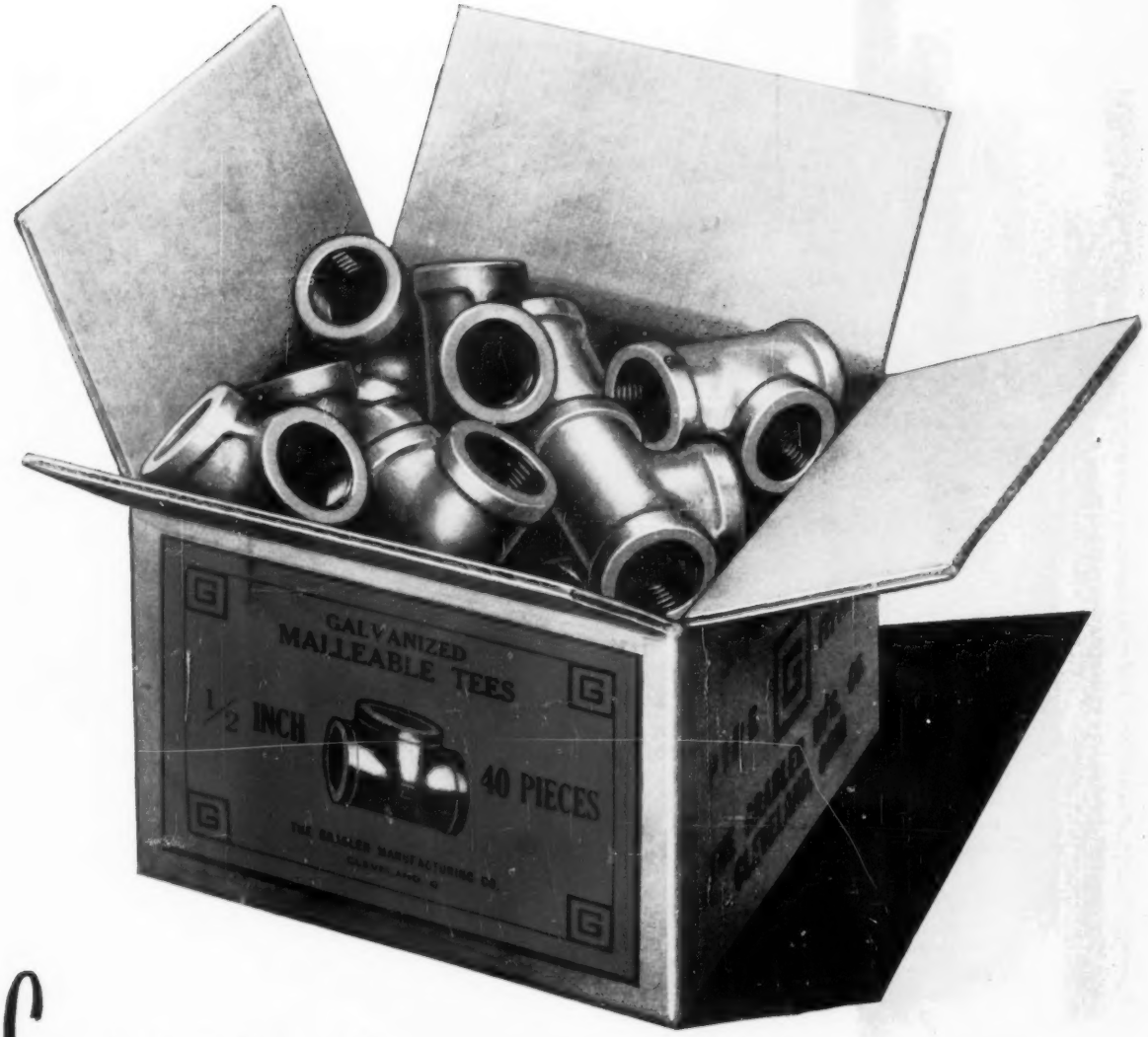

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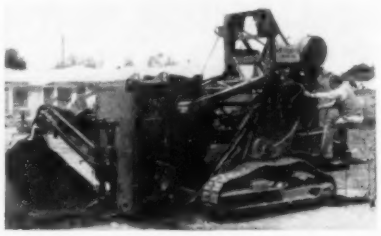

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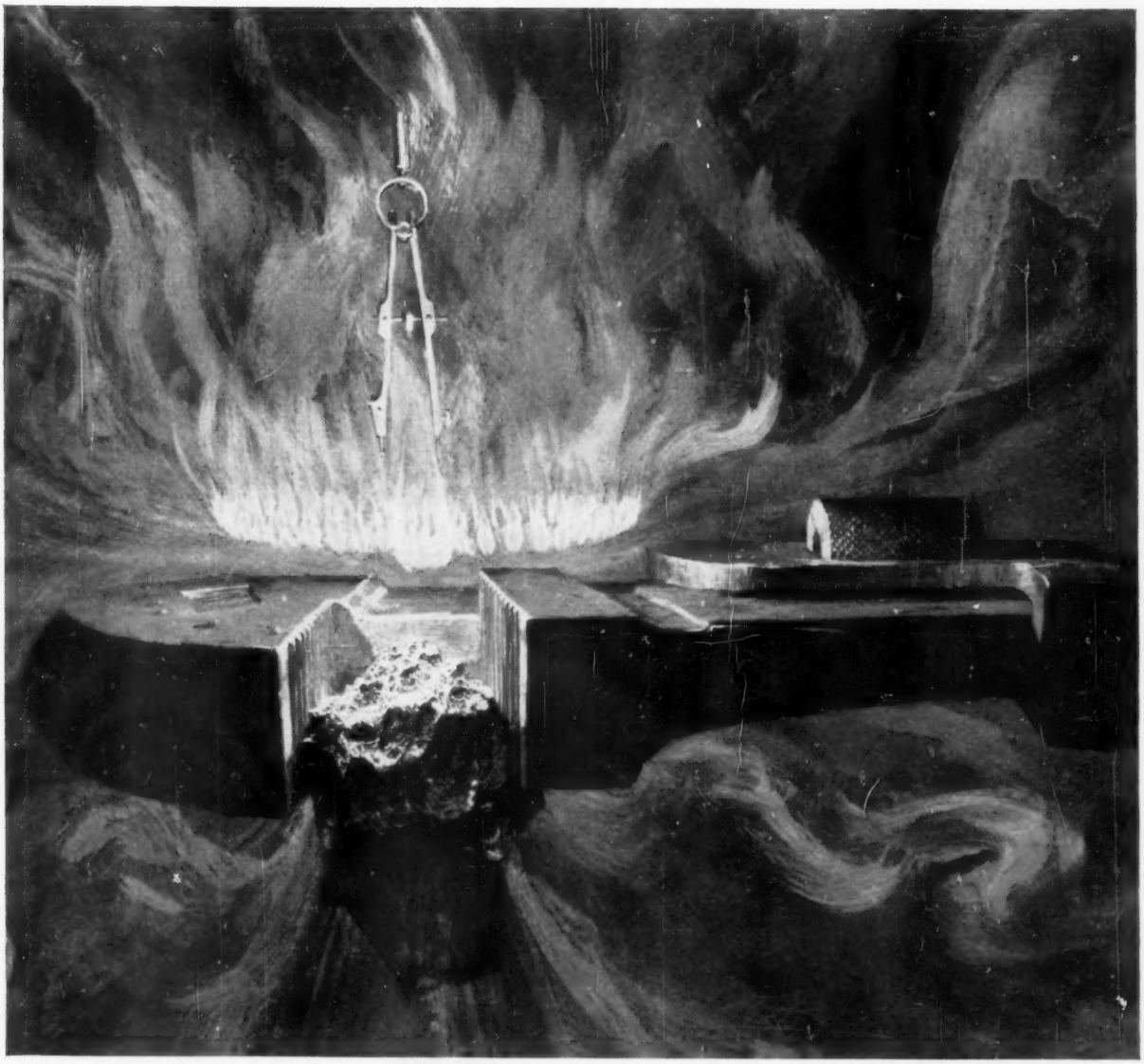

The delicate precision of a bow pencil, the inexorable power locked in the jaws of a sturdy Stillson wrench, coke and blue flame—with these symbols Stanley Meltzoff evokes the drama of gas production, and the industry's manifold contributions to the American way of life.

United Engineers is well known throughout the gas industry as designers and developers of today's finest gas production processes and equipment. For example, the U.G.I. Cyclic Catalytic Reforming (CCR) Process is being advanced through further work in reforming heavy oils and the construction of new, larger size, higher capacity apparatus. Recent operations on U.G.I.-Hall regenerative oil gas apparatus have resulted in substantially increased capacities. Development work is continuing on processes for the production of gas and petrochemicals from heavy oils and coals. Fluidized bed processes have excellent application in this field.

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GAS Thermally Thinking

Needed:
New domestic gas appliance connections

HOME builders and architects I have talked with in various sections of the country keep mentioning the need for a more modern gas appliance connection in homes. They don't like the idea of an unattractive house-piping stub extending from the wall or floor in homes that they build for a client or for general sale. They say the cap or stopcock (also capped) on the stubbed-out pipe is also deteriorating to the appearance of the home.

This attitude accounts for—to some extent—the fact that our electric competitors have greater success with the building industry in getting electric outlets provided in new homes, as compared with outlets for connecting gas appliances. Let's face it, a neutral or matched-tone, flush-with-the-wall electric utility outlet is more pleasing to the aesthetic eye than a couple of inches of galvanized iron (or other) pipe with an appliance stopcock protruding a couple of inches from the wall or floor. Also, it is ridiculously easy to "plug-in" an electric appliance. Often, a plumber is needed to safely connect a gas-fired appliance if the builder did happen to install convenience gas connections for range, refrigerator, dryer, etc. Thus, we have the penalty for using gas appliances as mentioned in this column in the September 1956 issue.

Why not develop a modern, pleasing-looking, flush-with-the-wall gas outlet for the home? Surely with all the engineering and research that are available to the gas industry, and associated suppliers of equipment, such a device can be developed. There should be many ideas for such items that could be generated from within our industry.

A good friend down in Texas reminded me that one of the better known makers of brass fittings introduced a valve that was concealed under a plastic plate that could be set flush. The plate was about twice the size of a conventional electrical utility outlet. The valve handle, in closed position, was flush with the plate. A small door could be opened to expose a tubing thread on the end of the valve designed to take standard 0.375-in. SAE copper tubing threads. I don't know what happened to this device that was introduced just before the outbreak of World War II. Possibly, war-time shortages were involved.

I am sure most of us can visualize many refinements that could be made to such a system or think of other systems that could be worked out. You will be reading more about this subject in this column in coming issues.

In the meantime—ideas, anyone?

J. Fred Ebdon

EDITOR

A CHILTON PUBLICATION
198 S. Alvarado St., Los Angeles 57
Tel. DUnkirk 7-4337

Frank Chapman, Publisher

J. Fred Ebdon, Editor

Don Wright, Managing Editor
Guy Corfield, Technical Editor
Barbara Hall, Assistant Editor
Murray Simkins, Eastern Editor

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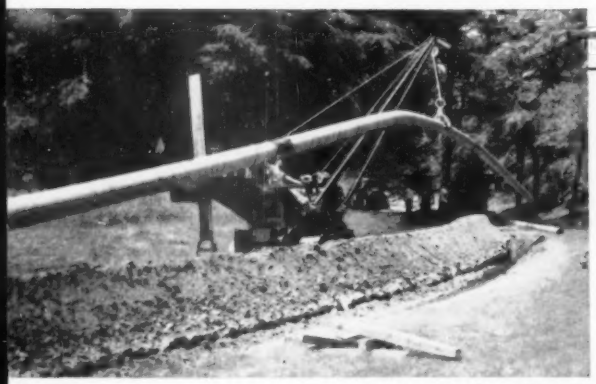

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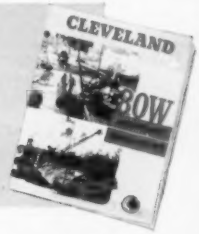

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GAS highlights

JANUARY 1957

SPOT NEWS, TRENDS, COMMENT ON GAS INDUSTRY AFFAIRS

Gas industry people will be watching "Playhouse 90" and Julia Mead Thursday, Jan. 10, as our first national TV advertising effort goes out to 125 stations on a network across the nation. Make a note to catch this program. The AGA National Gas Industry's Television Committee has bought sponsorship of a half-hour, on alternate Thursdays, of this show—one of the best currently being produced. Miss Mead will be hostess to millions of viewers for gas utilities, pipeliners, producers, and equipment suppliers. She will also make appearances at gas industry functions throughout the country.

Pipe hauling and stringing contractors have been hit with a new ruling from Internal Revenue Service. If they both haul and string pipe for gas utilities or pipelines, the entire operation is subject to the transportation tax. The tax is applicable whether the carrier strings the pipe or subs it to another outfit. The gas companies may save some money by stringing themselves or making a separate contract for stringing. Then the transportation tax does not apply to the stringing operation. The ruling is IRS No. 56-590. Drop us a line if our Washington Bureau can help you on it.

Houston Texas Gas & Oil Corp. and Coastal Transmission Corp. will probably have authority to build their joint $145 million project as you read this. Coastal will build from the Rio Grande valley (Texas) to Baton Rouge, La., where Houston Texas Gas will tie-in and build the line on into Florida. The case skipped the usual FPC examiner's opinion and went instead directly to the full body for speedy decision. Examiner Law recommended this. Coastal and Houston had contracts with gas producers that would have expired Dec. 31. About 47 per cent of their gas supply was so contracted. Expiration would have meant months of delay to renew contracts and re-present the project to FPC. Officials in the state of New York are worried about the price Houston-Coastal is paying (average 16.5 cents/Mcf). They fear prices of Gulf Coast gas might be increased in relation and lead to higher prices for natural gas to New York customers. Only real opposition to the line (there are no competing applications) was from bottled gas and fuel oil dealers and service companies. Reports are out that Coastal and Houston Texas Gas have options for the pipe needed and can finance with ease. Look for natural gas in Florida from their line in mid-1958.

In spite of the "tight" money market, Trans-Canada Pipe Lines, Ltd. hopes to secure financing ($375 million) prior to the latest deadline extension to Feb. 1—the sixth extension. In view of the deteriorating money market, it seems likely that more junior financing—common stock—than originally planned will have to be used. Meantime, construction continues and about 230 miles of pipe are in the ground. The much-discussed 34-in. pipeline has made its first major river crossing (the Assiniboine) near Miniota, Man. Pipeliners are doing a good job of fighting winter and building the pipeline.

The gas utility industry connected its 30 millionth customer at some unspecified spot in the U. S. on Dec. 11, according to the AGA. This new customer represents the doubling of total customers served with clean, dependable natural (mostly) gas in less than two and one-half decades. But, in spite of this meteoric growth, the gas industry is challenged by future growth that will require it to spend nearly $19 billion between 1956 and 1965. At present, the 30 million connected customers use over 90 million gas-fired appliances. The AGA prognosticators point out a potential market for nearly 125 million gas appliance sales between now and 1965. Thirty-three million of these will go into new homes to be built in the next 10 years.

The attorney general of California, Edmund G. Brown, claims the purchase of Pacific Northwest Pipeline Corp. stock by El Paso Natural ". . . will eliminate California's hope for cheaper gas and will result in suppressing competition and creating a monopoly in the furnishing of gas in interstate commerce to California." He feels the proposed move is a violation of the Federal antitrust laws and has asked U. S. Attorney General Brownell to launch an antitrust investigation by the federal government. The only competitive source of supply to California would have been a line from Pacific Northwest's **Scenic Inch** from Portland, Ore. (or Mountain Home, Idaho) to the California border. One of these will still be constructed if El Paso and Pacific Northwest can complete their integration plans; however, El Paso Natural will continue to be the single source of natural gas in the state.

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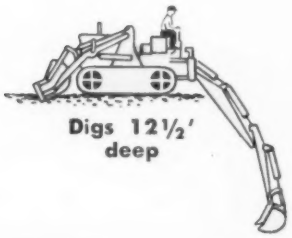
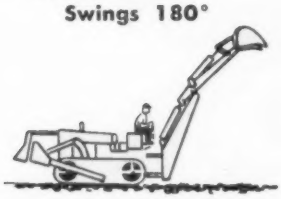


Digs 12½' deep

Swings 180°



Dumps 13' high

One look at TerraTrac's husky welded steel box-section boom and dipper stick tells you this rugged crawler-mounted backhoe is *really built for heavy-duty trenching and excavating.* It reaches further, digs deeper, dumps higher, has a wider swing-angle than any other tractor-hoe in its price range. But that's not all. This new TerraTrac unit also has *far more power and speed for tough digging.*

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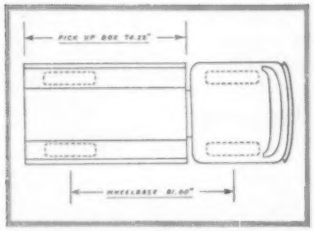
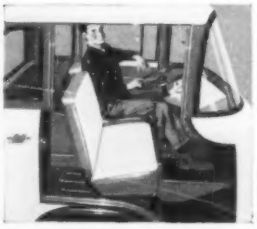
Ask your 'Jeep' dealer for an on-the-job demonstration!



New Forward Control Design places the engine behind you, puts every inch to work, gives you up to 200% greater visibility.



New Safety-View Cab is extra roomy, has largest wrap-around windshield in the FC-150 weight class.

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*regulatory and legislative trends

Utilities are targets for new taxes

Taxes on utilities are staggering now, but with the growing demand for tax revenue by local governments the assessments are certain to become larger. Politicians consider that taxes against the utilities, which are hidden in the bill for service to consumers, provide an easy method for obtaining more governmental revenue. There is no question about a utility's right to be reimbursed through consumer rates for its necessary operating expenses including taxes. The importance of taxes in the gas industry alone is manifest when one realizes that for 1955 $435 million were paid in federal taxes while the state and local taxes exceeded $255 million.

A recent decision by the Illinois supreme court, approving an occupation or privilege tax by Chicago on utilities, may start an epidemic of such taxes. Chicago passed an ordinance taxing persons engaged in the business of selling and distributing gas in Chicago at 5 per cent of gross receipts. It also passed an electricity ordinance taxing the electric utility 5 per cent of gross receipts, but allowed a credit equal to the payment for street use. The electric utility pays 4 per cent under its franchise for use of streets in Chicago, so the new tax exacted only 1 per cent of gross receipts. The gas utility did not have a city franchise, because under a perpetual charter granted by Illinois in 1855 and consented to by Chicago it is not required to pay a franchise fee for use of city streets.

The gas utility contended that the new tax of 1 per cent against the electric company and 5 per cent against the gas company was unconstitutional, because it was not uniform as to taxpayers in the same class and it impaired the contract with Chicago. The Illinois supreme court ruled that the new tax was valid saying:

"It appears that at the time the instant ordinance was passed, Peoples Gas was engaged almost entirely in the sale of natural gas for fuel purposes. In this field, it is admitted that gas and electricity may be competing services. But even here, there are basic differences in the means by which the two products are produced, distributed and used; and so many variable factors are involved in determining their respective market positions as to negate the absolute necessity for a single classification.

"Third, although there are no Illinois authorities directly in point, there are cases where this court has upheld legislative classifications that differentiated between objects having similar characteristics or attributes. ***

"For the reasons stated, we do not believe it has been demonstrated that the legislative classification is unreasonable or arbitrary; hence, we conclude that the requirements of section 1 of Article IX of the Illinois constitution have been met.

"Next, Peoples Gas contends that the tax results in the unconstitutional impairment of a contract subsisting between it and the city. The argument runs as follows: Peoples Gas, under its charter, is not obligated to pay the city for use of streets; nor does the city have statutory authority to exact street use payments. * * *

Commonwealth Edison, on the other hand, pays the city 4 per cent of gross receipts for use of streets, as required by franchise agreement. So, while both the 'Gas Ordinance' and the 'Electricity Ordinance' purport to tax at the rate of 5 per cent, in actual effect Commonwealth Edison pays only an additional 1 per cent. Therefore, the purpose of the city council was not to exact an equal tax rate, but under the guise of a taxing ordinance to impose a street use charge of 4 per cent on Peoples Gas. This, it is asserted, is an unconstitutional impairment of contract.

"However, even if we accept the contention of Peoples Gas that the city sought to equalize the actual rate of recovery from the two companies and in effect exacted unequal tax rates, still the 5 per cent tax under the 'Gas Ordinance' does not cause an unconstitutional impairment of contract. For, as aforesaid, the legislature's grant of authority, containing a valid classification respecting sellers of electricity and sellers of gas, authorized a tax against Peoples Gas up to an amount equal to 5 per cent of gross receipts. Up to this amount the tax is valid regardless of what rate is purportedly imposed or actually exacted under the 'Electricity Ordinance.' Even if the actual motive of the city council was as represented, there is no constitutional bar to their so acting. The city had express authority from the legislature

*A monthly commentary on national and state developments by an expert in the field of utility law.

Regulatory trends . . . Some states raise rates in taxing cities

to do the very thing it did (*i.e.*, impose a tax against sellers of gas not exceeding 5 per cent and a tax not in excess of 5 per cent against sellers of electricity), and this delegation of power was shown to have been valid."

To cope with the recent multiplication of local taxes against utilities, some regulatory commissions have exposed the device and have made consumer rates higher in the taxing cities.

For illustration, the Missouri commission considered rate making for a utility serving many cities with some of those cities having license taxes, and decided that:

"The Commission is of the opinion that a license tax levied by one or more cities is altogether different from general taxes which are assessed against all of the property owned by a utility, or income taxes assessed against a company's income from all its operations. A license tax is assessed wholly as a revenue producing measure for a particular city or town making the assessment and the Company's system-wide operations are not benefited by the payment of such tax. For that reason it should not be included as an operating expense to be borne by parties receiving no benefit from it. It can be reasonably inferred that all persons receiving service through a particular exchange located in the city where such persons reside are benefited by such tax imposed by the city. Likewise it can be reasonably inferred that persons receiving service through other exchanges receive no benefit from such tax."

In prescribing rates for a gas company, the Colorado commission asserted that:

"A study of these two articles indicates that the city of Cortez expects and anticipates that a franchise tax shall be collected from the customers receiving service outside of the city, which tax shall be paid to the city. This is, in our opinion, contrary to good regulatory practice. There is no justification on the part of the city to charge any such tax since the applicant will operate outside of the city under our certificate of public convenience and necessity and not under the franchise of the city. The applicant should not, therefore, be required to collect taxes on people residing outside of the city of Cortez to be paid over to the Cortez municipal government. * * *

"Since we believe a franchise tax is applicable only within the city limits of Cortez, we will require that applicant file its tariff for gas service to provide that the franchise tax will apply only on customers served within the city limits. This tax will be itemized on the bill, and designated 'franchise tax'."

Another tax decision jumped to prominence recently when the United States Supreme Court declined to review a Michigan court case. Michigan tried to impose a franchise tax, based on an interstate natural gas pipeline company's operations outside as well as inside Michigan. The State of Michigan expected $20 million a year from this franchise tax on utilities, but the Michigan supreme court ruled that a state has no right to base its franchise tax on business which a pipeline company does outside the state, and the United States Supreme Court would not change that ruling.

Taxes are becoming such a large part of a utility's operating expenses that farsighted managements are seeking ways to discourage the provincial exactions. One way is to notify the local consumers that their city is just using the utility as a tax collector for the itemized amount shown on the bill. In addition, the subject of the total amount of taxes hidden in the utility ratepayer's bill could be exposed in a public information program.

"The power to tax is the power to destroy," even today as it was in the early years of our government. ■

GAS current reading

APPLICATION OF HEAT TO DOMESTIC GAS STORAGE WATER HEATERS — Research Bulletin 71, published by the American Gas Association Laboratories, 1032 East 62nd St., Cleveland 3. Price: $2.

The construction of an experimental gas water heater capable of efficiently delivering much larger quantities of hot water than most contemporary units of comparable size is described. The experimental work was performed at the lab under PAR Project DA-2-WH, sponsored by the committee on domestic gas research.

The bulletin makes available data on the relationship between burner and appliance and extends the basic burner design data with regard to the application of heat to contemporary storage-type water heaters. This research was slanted toward obtaining information that would be useful in improving water heater performance by increasing the recovery capacity or by reducing the physical size of contemporary units without reducing deliverable quantities of hot water and without making the storage tank more susceptible to corrosion than is the case with more conventional types of water heaters.

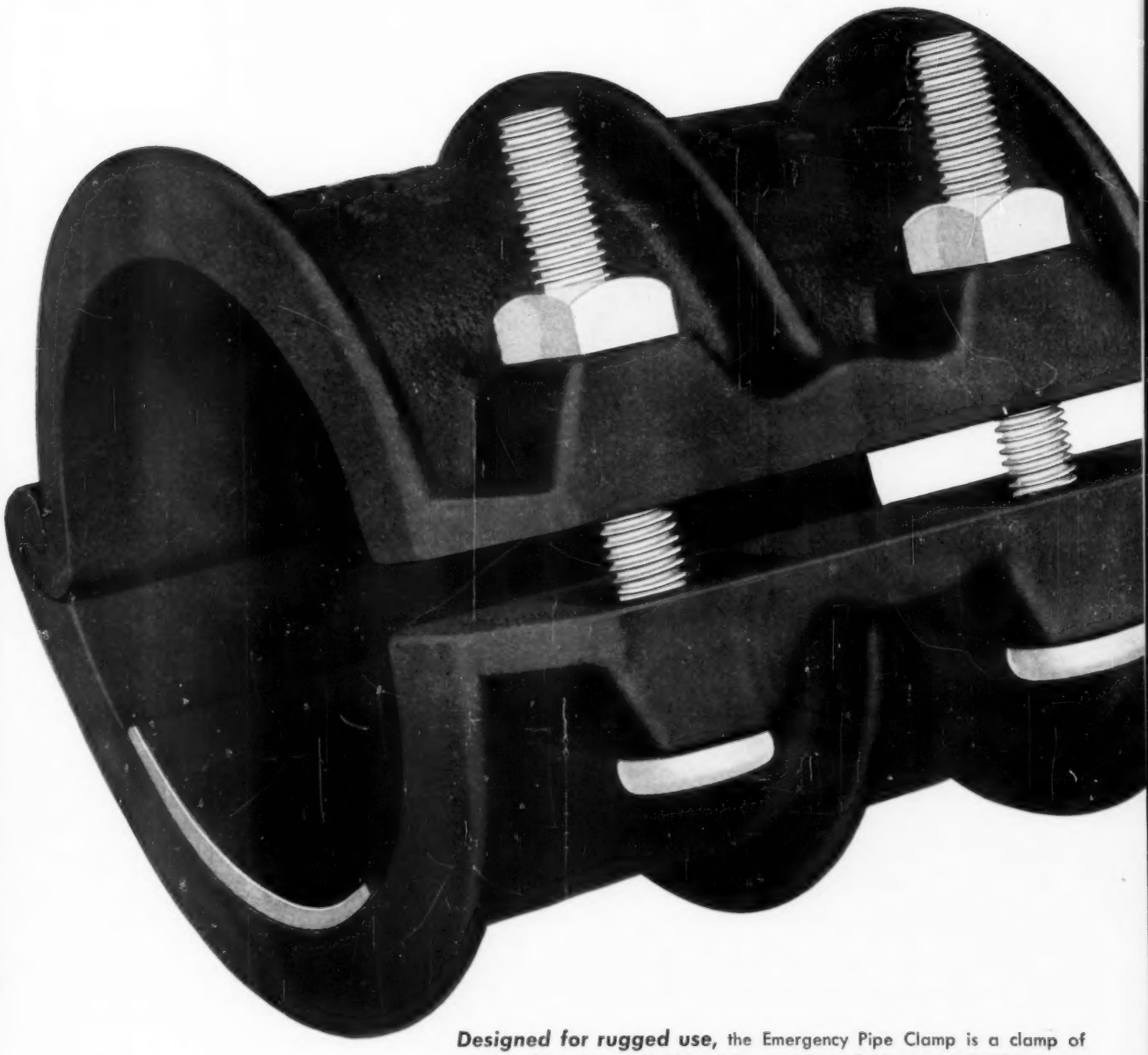
NATIONAL FIRE CODES—Published by National Fire Protection Association, 60 Batterymarch St., Boston 10. Cost: $6 per volume.

The 1956 edition of the National Fire Codes, a compilation of 176 fire safety standards, contains 32 new or revised safety standards.

Fields covered in the volumes include: Volume I, flammable liquids and gases; Volume II, combustible solids, dusts, chemicals, and explosives; Volume III, building construction and equipment; Volume IV, extinguishing equipment; Volume V, electrical; Volume VI, transportation and miscellaneous.

The codes, in keeping with the traditional objectives of the NFPA, are offered as a suggested basis for safety to life and property from fire without causing undue inconvenience and expense.

THE CLAMP WITH GUTS!



Designed for rugged use, the Emergency Pipe Clamp is a clamp of almost unlimited strength. You might say it looks fairly simple. Yet fifty years of experience have gone into its design . . . the heavy ribbing to "take" the bolt-pull, the skillful shaping of the bolt lugs for terrific strength and a free wrench swing. The full length, massive hinge which no strain can loosen! The over-thickness of metal throughout to make child's play of any pressure! The glove-like fit . . . result of shaping each clamp over an accurate mandrel, pulling it down with a 12,000 pound air vice and sledging to complete snugness.

When you put on the Emergency Pipe Clamp, it is there to stay. Tens of thousands of them are still in place after 20, 30, 40 years' service. Made in C.I. and steel pipe sizes—½″ to 12″ inclusive.

Write for Catalog GW
M.B. SKINNER CO., South Bend 21, Ind.

SKINNER-SEAL EMERGENCY PIPE CLAMP

Sherman Power Digger Digs Six to Eight 60 Foot Trenches, 7 Feet Deep, in a Single Day!

Five Sherman Power Diggers, averaging 40 hours of work each, every week, are doing more than their share to maintain the position of Bell Plumbing and Heating Co., Denver, as one of the nation's major contractors.

As Mr. William Stecher, plumbing superintendent for Bell, puts it, "We have found that this equipment can dig six to eight sixty-foot ditches a day. All of them are seven feet deep. I would guess that each machine does the work of six men at about one half the price."

In addition to digging trenches for water and sewer lines, the Shermans are used for a variety of other digging and trenching jobs about the building sites.

With their Shermans on the job, Bell Plumbing and Heating no longer has to sub-contract normal digging jobs. Before purchasing the units, schedules often had to be adjusted for the sub-contractor and delays of several days were not uncommon. Now, work is completed on schedule.

Sherman Power Diggers can cut costs and speed production for your company, too. See your local Ford Tractor dealer TODAY for a demonstration or write for free Bulletin No. 450.

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Power Digger soon
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ROYAL OAK, MICHIGAN
POWER DIGGERS* • FRONT END LOADERS • FORK LIFTS
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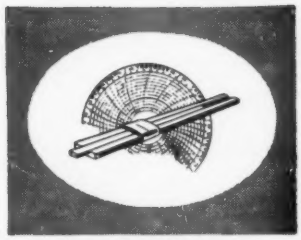
technical trends



By GUY CORFIELD

Flammable liquids, gases in manholes and sewers

An interesting pamphlet with the above title has recently become available. It was developed by a National Fire Protection Association committee on maintenance and repair, and approved by the committee on flammable liquids and the committee on gases (the latter having representation from AGA).

This 32-page pamphlet discusses sources and nature of flammable liquids and gases in underground spaces, means or sources of ignition, and unsafe and safe practices for construction, operation and maintenance. In the summary are recommendations to utility companies and other owners and operators of underground pipelines and duct structures, and to administrative bodies with respect to ordinances and other controls.

This pamphlet, identified as NFPA No. 328M, can be obtained for 25 cents (with discount for quantities) from National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass.

Zirconium and hafnium

Zirconium and hafnium are metals that until recently have been little known and used. They are not particularly rare; in fact, zirconium is the ninth most abundant metal in the earth's crust, being found plentifully in beach sands, and hafnium is present in about 2½ per cent in zirconium ores. Extraction and purification methods have, however, previously been difficult and expensive and zirconium sponge, an unfabricated form containing hafnium, currently costs about $15 per lb. New processes have been developed and the Atomic Energy Commission has contracted for 11 million pounds, over a 5 year period, at a total cost of $75 million or about $7 per lb. It will be used almost entirely for nuclear reactors because of its corrosion resistance and structural strength at high temperatures (melting point 3370°F.), and its suitability for cladding or containing the uranium fuel and permitting the passage of neutrons which activate the uranium.

Merely as a structural material, the normal hafnium content is not detrimental, but when used to clad the uranium the hafnium must be removed as hafnium has the reverse property of absorbing neutrons. This neutron absorbing effect of hafnium, however, makes it also useful in nuclear power production as non-corrosive rod material for controlling the rate of reaction. Thus the zirconium shell lets the activating neutrons pass through to the reacting uranium, and the adjustable hafnium rods control the rate of neutron passage by absorbing the surplus.

These two metals will no doubt find other applications as the price is progressively lowered to an expected $3-5 per lb.

Hydrogen and ammonia by partial oxidation

What is assertedly the first full scale plant to make ammonia and other nitrogen-hydrogen products by partial oxidation of natural gas, has been in operation by Spencer Chemical Co. at its Vicksburg, Miss. works since February 1956. The patented process had been pilot-planted in California by the Texaco Development Co.

The Vicksburg plant consumes from 12 to 15 MMcf/day of natural gas, of which 9 to 11 MMcf go into the process and the remainder is used as fuel. The prime production is 220 tons/day of anhydrous ammonia, which is converted into nitric acid, ammonium nitrate solution, and ammoniating solution sold as "Spensol." The main process proceeds in four steps:

1. Separation of air into oxygen and nitrogen, by compression and cooling.
2. Partial oxidation of natural gas by burning with oxygen to form a carbon monoxide-hydrogen mixture (actually containing about 60 per cent hydrogen, 1 per cent methane, 0.75 per cent nitrogen and argon, a few per cent of carbon dioxide, and the remainder carbon monoxide). The gas generators operate at 350 psig and "in excess of 2000°F." Carbon formation can assertedly be almost completely avoided by careful control of the oxygen-methane ratio in the feed, the ratio being intermediate between that required for theoretical CO, and CO_2 formation. The mixture is water scrubbed and put through a "shift conversion" over iron oxide catalyst, which converts 90 per cent of the carbon monoxide content to hydrogen and carbon dioxide.
3. Purification of the hydrogen by scrubbing with ethanolamine to remove carbon dioxide, dehydration in activated alumina dryers, and final scrubbing with liquid nitrogen to remove the remaining traces of methane, carbon monoxide and argon.
4. Combination of the hydrogen with nitrogen, in the "ammonia synthesis loop" at 3600 psig, to form anhydrous ammonia.

An item of interest, consistent with modern instrumentation, is that the entire plant only requires eight operators per shift, about one-third of the number previously employed in a comparable plant.

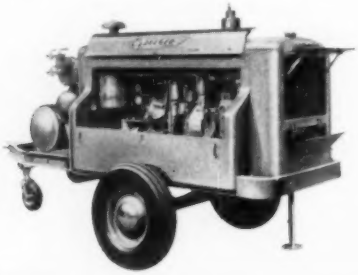
DRILLING GAS MAINS UNDER PRESSURE: Jaeger "125" rotary compressor powers a Mueller C1-36 Drilling Machine, drilling a 10" main under pressure, preparatory to installing line stopper plug. The unfluctuating pressure maintained by the Jaeger rotary insures a uniformly accurate cut, vital for proper seating of the inserted plug.

Jaeger Rotary maintains constant pressure at slower operating speeds

Jaeger compressors produce the same volume of air as other rotaries at 100 to 250 rpm slower engine speeds. Full load speed of a "125" is only 1700 rpm, of a "600", just 1650. This higher Jaeger efficiency saves horsepower, saves fuel, saves engine and compressor wear.

Instantaneous air delivery and smooth, stepless speed modulation enable a Jaeger rotary to maintain 100 lbs. constant pressure under all normal operating demands.

8-hour fuel tanks, full size tool boxes and retractable pneumatic tired dolly wheel are standard on all 2-wheel models. For complete data or demonstration, ask your Jaeger distributor or write for Catalog JCR5.



JAEGER "250" — biggest rotary compressor on two wheels. 4-wheel units to 600 cfm.

THE JAEGER MACHINE COMPANY
661 Dublin Ave., Columbus 16, Ohio
PUMPS • CONCRETE MIXERS • TRUCK MIXERS • PAVING MACHINES

FAST TRENCHING: Jaeger "125" maintains full pressure in two #25 Thor breakers. Speeds trench cutting and other work with power tools.

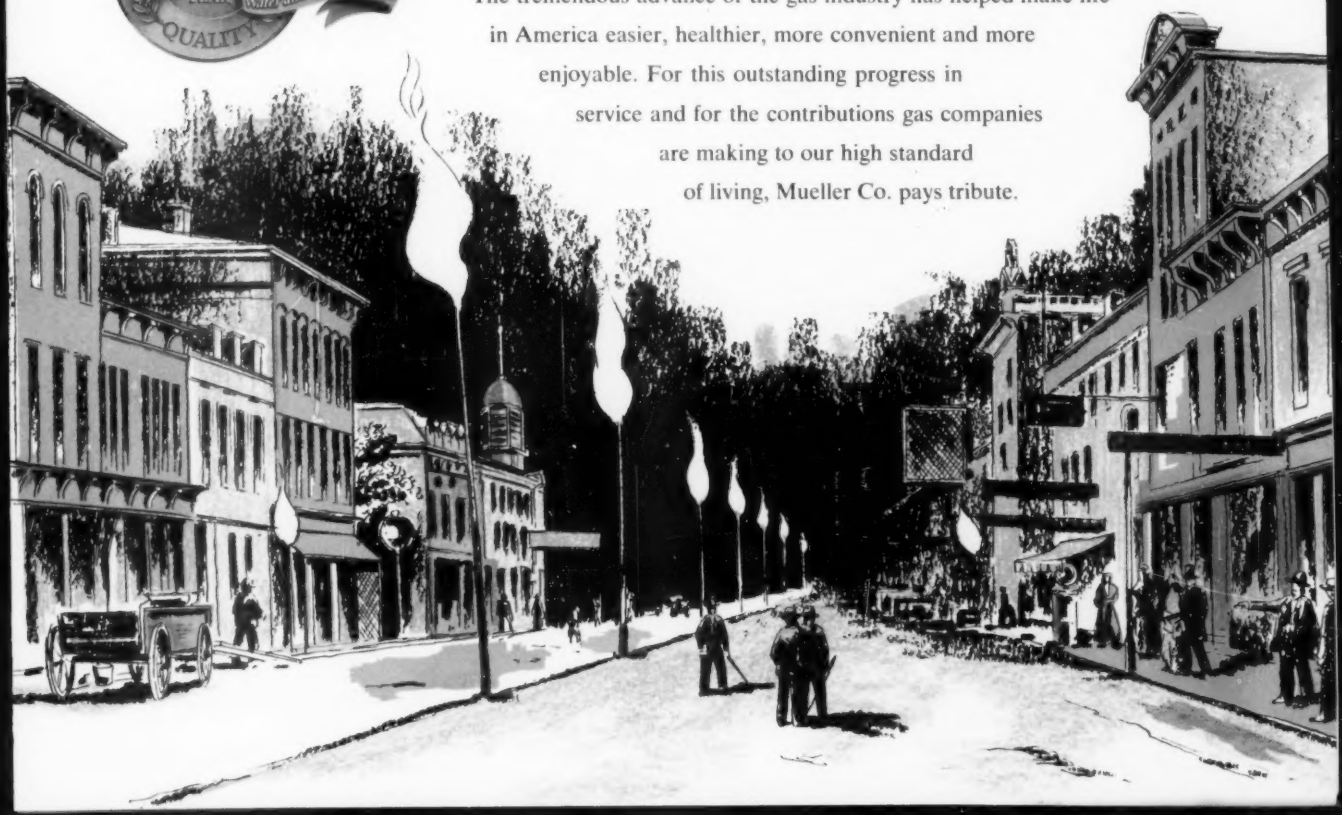
from a dream to a reality

66 billion therms of gas each year

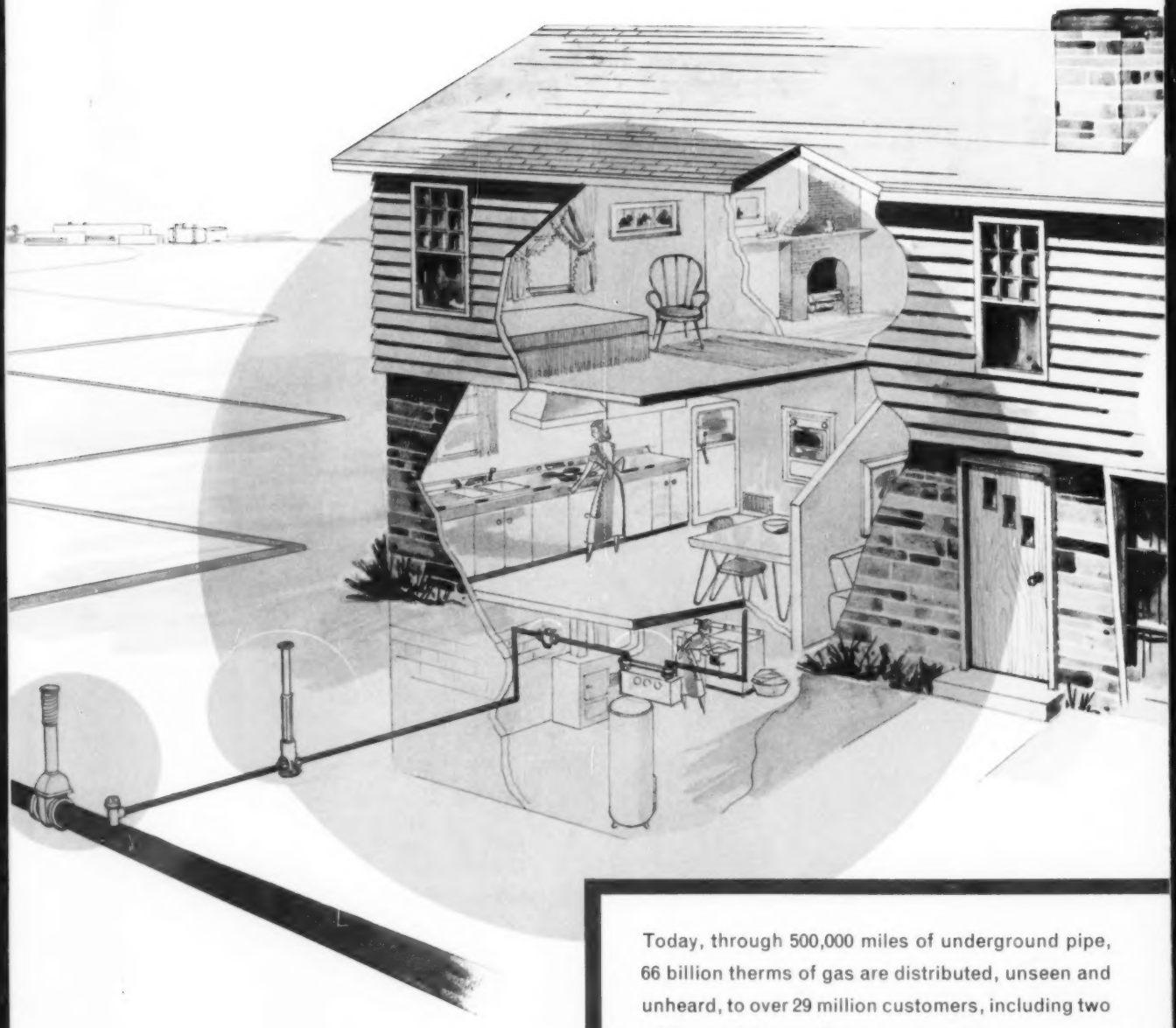
One hundred years ago, only 92 families were fortunate enough to have gas stoves on which to prepare meals. The use of gas in home and industry was only a dream of the future. Today, that dream is a reality as 29 million customers utilize 66 billion therms of gas each year.

MUELLER CO. 100th YEAR SERVING the Water and Gas Industries QUALITY

The tremendous advance of the gas industry has helped make life in America easier, healthier, more convenient and more enjoyable. For this outstanding progress in service and for the contributions gas companies are making to our high standard of living, Mueller Co. pays tribute.



Serving 29,000,000



Today, through 500,000 miles of underground pipe, 66 billion therms of gas are distributed, unseen and unheard, to over 29 million customers, including two million industries. Gas companies add services for 4,000 new customers each day.

MUELLER CO. 100 YEAR QUALITY SERVING the Water and Gas Industries

American Homes and Industries

The gas industry was founded by William Murdock, a British engineer and inventor, who lighted his cottage with manufactured gas in 1792. By 1803, he had progressed enough to utilize manufactured gas to light an entire factory.

Following Murdock's success, lighting with manufactured gas was adopted in America in 1816, when gas lights were used in Rembrandt Peale's museum in Baltimore. This proved so successful that the city contracted with Peale for the manufacture of gas to light city streets.

Use of natural gas in America was introduced at Fredonia, New York in 1821 and the first natural gas company was organized in that city in 1858. Yet, a year later, there were less than a hundred families in the entire nation preparing meals on gas stoves.

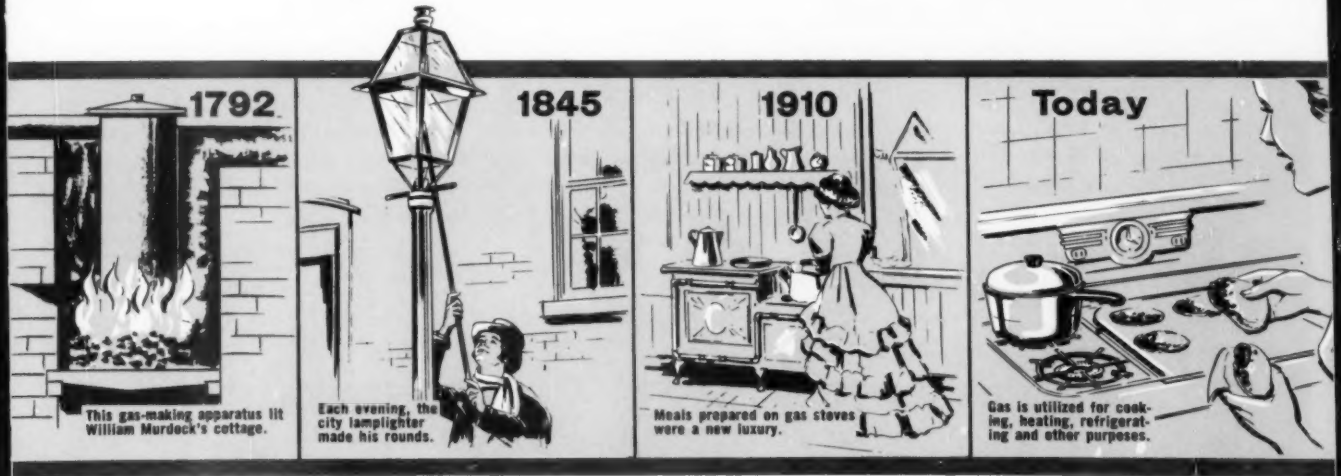
Nor was acceptance of gas lighting rapid, as it was a radical change from popular lighting methods. It was not until the decade from 1865 to 1875 that the use of gas for lighting and cooking began to make significant progress.

By 1920, gas usage had been firmly established. Then, the technique of welding together lengths of steel pipe, capable of transmission of gas under pressure, was perfected, permitting bulk transport of gas. Today one-half million miles of steel pipe, more than twice the nation's railroad mileage, carry gas, underground, to customers in every part of the United States.

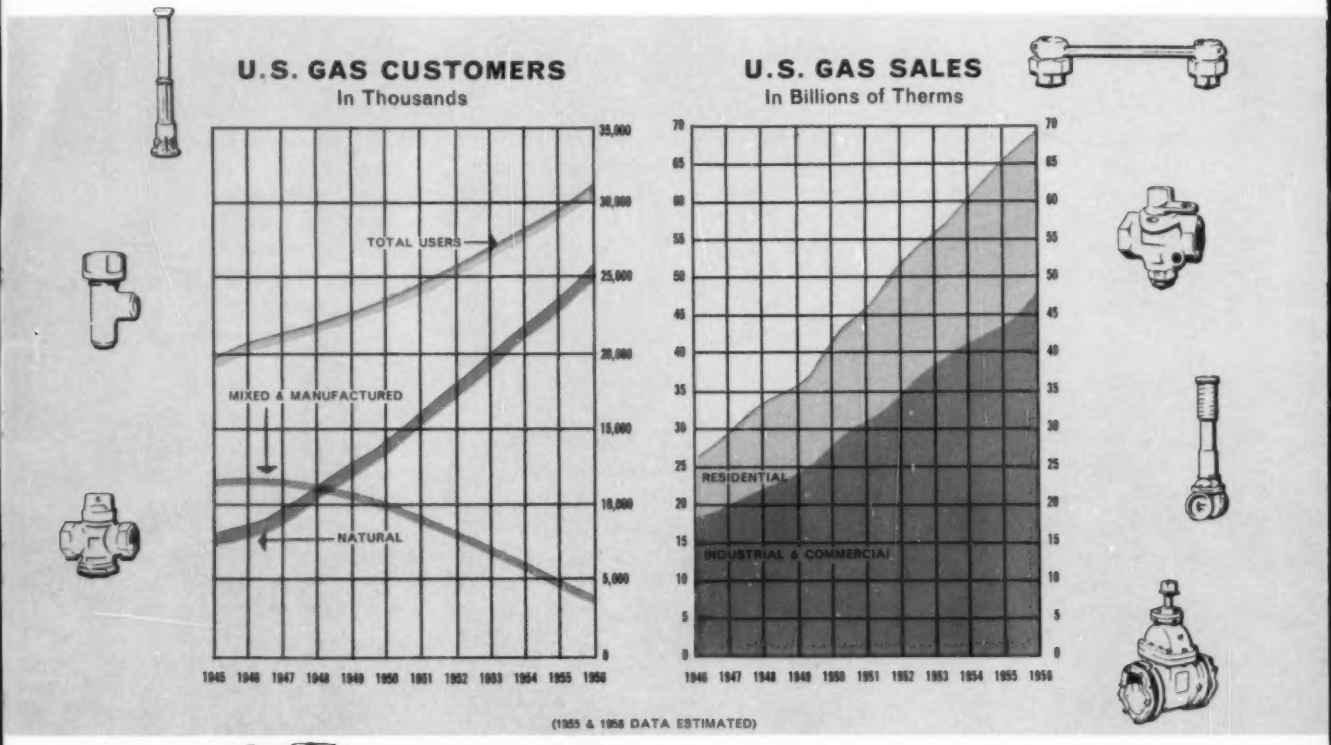
In 1950, Mueller Co. introduced the No-Blo equipment line providing the industry with a fast, safe method of installing new services and repairing or revising existing systems. Mains can now be drilled, tapped and service fittings installed without interrupting service to other customers and in complete safety, without loss of gas. The development of No-Blo greatly facilitated installation of new services by gas companies everywhere.

For each of the 4,000 new customers added to their services each day, gas companies must install a service line, meter and necessary fittings, with additional fittings required for industrial customers. And, to insure adequate service for rapidly multiplying suburban areas and for other growing areas, gas companies must also install thousands of miles of new mains and laterals with service fittings. As gas service is increased, existing systems will require larger mains and additional facilities to provide increased volumes and necessary pressures.

In 1956, revision of existing gas services and installation of additional services reached a record cost of $399,315,000, as total construction expenditures topped 1.3 billion dollars. An additional outlay of 187 million dollars each year is allocated for maintenance and repair.


1792
This gas-making apparatus lit William Murdock's cottage.
1845
Each evening, the city lamplighter made his rounds.
1910
Meals prepared on gas stoves were a new luxury.
Today
Gas is utilized for cooking, heating, refrigerating and other purposes.

What's ahead for Gas?



Over one million new customers each year make the future bright for the gas industry.

Use of natural gas could triple by 1975, according to government reports. Industry, with a 154 per cent increase in gas usage since 1946, will probably utilize much more gas in the future, as fuel, tool or ingredient.

By 1957, domestic usage is expected to increase as much as 147 per cent over 1946, with new installations of water heaters, furnaces and other equipment.

The gas industry presently has reserve resources of about 217 trillion cubic feet of gas, enough for about 23 years of consumption at the expected rate of eight trillion cubic feet next year.

But, the rapidly growing market, and the anticipated increase in usage, places a more probable estimate of the present gas reserve as being adequate for 10 to 15 years. Reserves are replenished regularly as new wells are brought in.

The development and expansion that gas companies have already undergone to meet the rapidly growing market clearly demonstrates their ability to handle any needs or problems of the future.

MUELLER CO. **DECATUR, ILL.**

Factories at: Decatur, Chattanooga, Los Angeles;
In Canada: Mueller, Limited, Sarnia, Ontario

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Since 1857

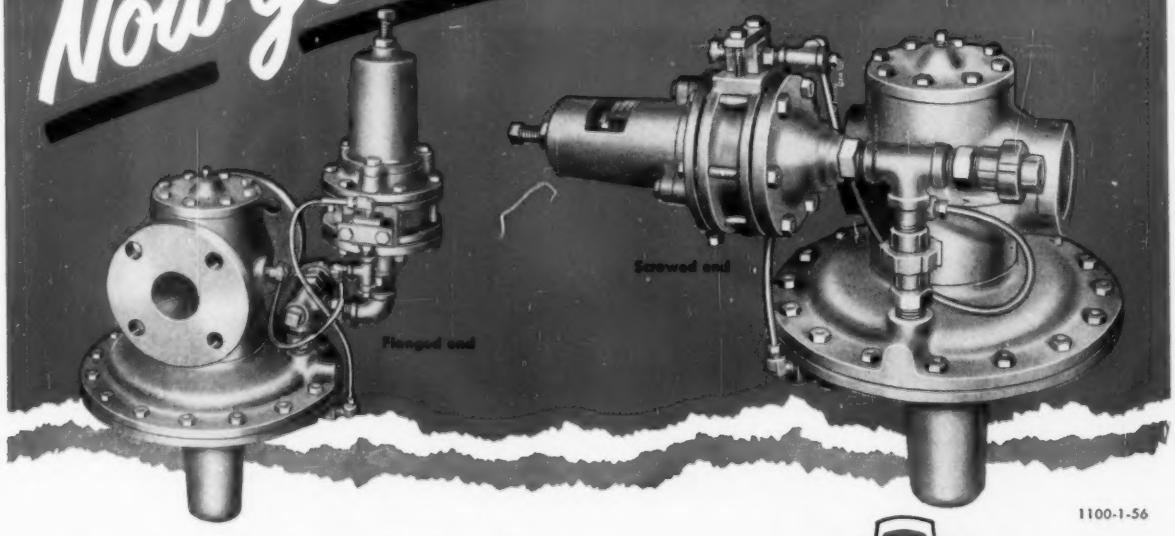
LINE PRESSURE GOING UP!

MEMO
FROM THE OFFICE OF THE PRESIDENT

Geo:—
Considering raising
line pressure
Better check this—
Now good up to
400 psi
Rehm.

Chaplin-Fulton '1100' REGULATOR

Now good up to 400 psi



1100-1-56

Now, more versatile than ever—good up to 400 psi. Your choice of three body assemblies—

2" flanged 250 lb.	rated for 400 psi
2" screwed end	rated for 400 psi
2" flanged 125 lb.	rated for 175 psi

All suitable for outlet pressure range from ounces to 150 psi with no change required in regulator or pilot—just change the pilot spring. It's accurate—versatile—compact! A good buy!

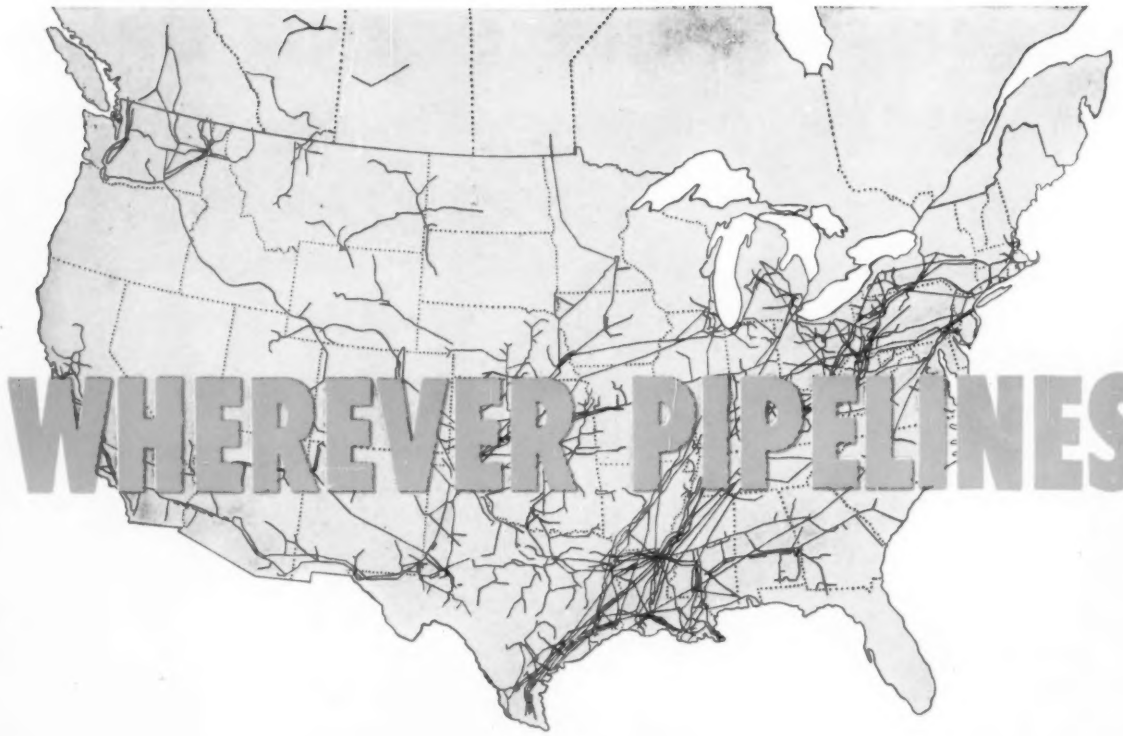
Why stock two, when Model '1100' will do?

And, if 400 psi is too low, why not try the all-steel Model '1200', good up to 1200 psi inlet and 600 psi outlet?

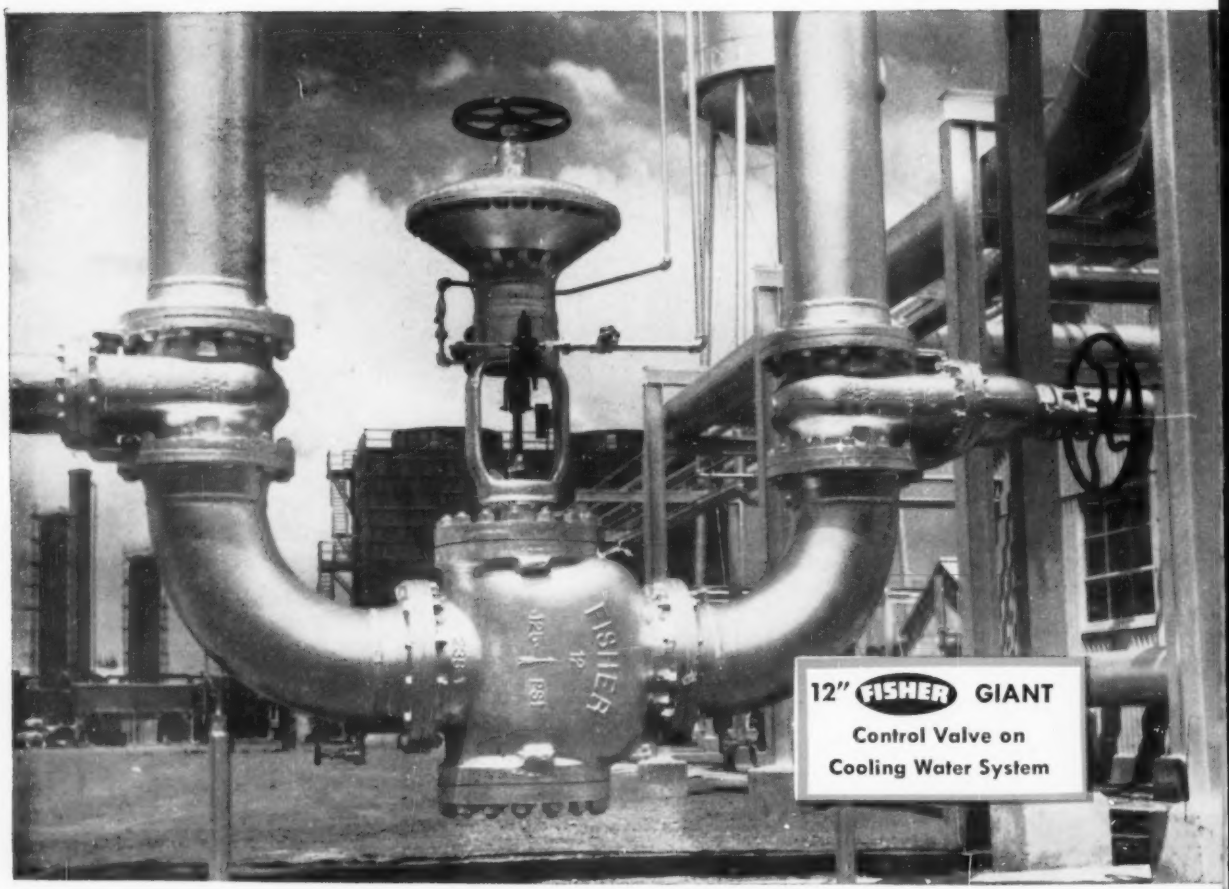
Full information on request.

ACCURATE CF MFG CO DEPENDABLE

Chaplin-Fulton
MANUFACTURING COMPANY
Pittsburgh 25, Pennsylvania



WHEREVER PIPELINES



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Control Valve on
Cooling Water System

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Pacific Northwest Pipeline Corporation selects FISHER for their stations and facilities

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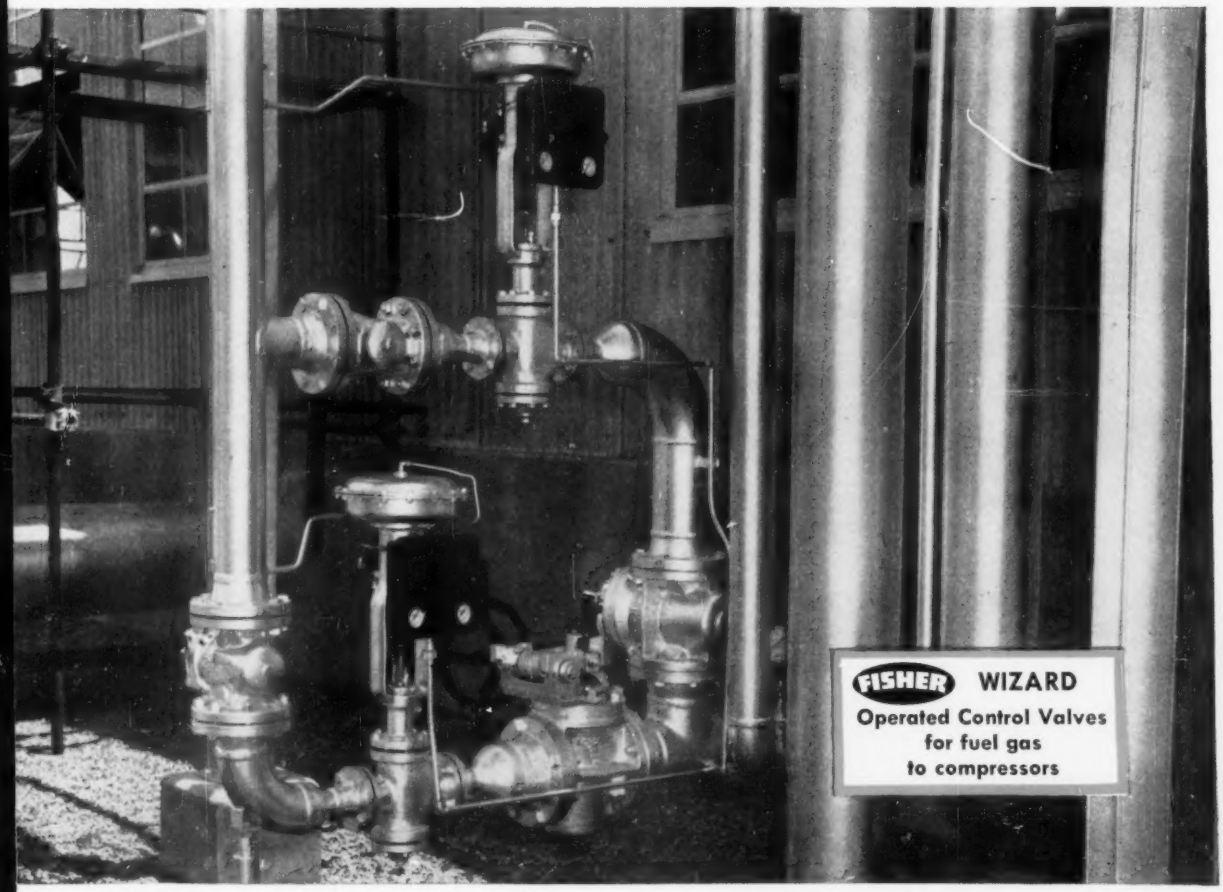
MARSHALLTOWN, IOWA • WOODSTOCK, ONTARIO



WORLD'S MOST

The Cast Iron Pipe Century Club...
Membership in this distinguished Club is restricted to water and gas supply systems still serving their communities through cast iron mains laid a hundred years ago... and more!

The Club's unique Honorary Certificate is earned only through performance. It is a tribute to the service supplied by these companies and to the carrier that enabled them to earn it... world's most dependable pipe... cast iron!

CAST IRON PIPE

UNUSUAL CLUB
adds 6 new members

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ALLENTOWN, Pennsylvania
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*ATLANTA, Georgia
Atlanta Gas Light Company
BALTIMORE, Maryland
Bureau of Water, Dept. of Public Works
BALTIMORE, Maryland
Consolidated Gas Electric Light & Power Co.
BOSTON, Massachusetts
Public Works Dept., Water Division
BOSTON, Massachusetts
Boston Consolidated Gas Co.
BOUND BROOK, New Jersey
Public Service Electric & Gas Co.
BRIDGEPORT, Connecticut
Bridgeport Gas Light Company
BUFFALO, New York
Dept. of Public Works, Div. of Water
CHARLESTON, South Carolina
South Carolina Electric & Gas Co.
CHICAGO, Illinois
Peoples Gas Light & Coke Company
CHICAGO, Illinois
Water Works Department
CINCINNATI, Ohio
Cincinnati Gas & Electric Co.
COLUMBIA, Pennsylvania
Columbia Water Company
DETROIT, Michigan
Board of Water Commissioners
DETROIT, Michigan
Michigan Consolidated Gas Co.
*ELIZABETH, New Jersey
Elizabethtown Consolidated Gas Co.
EVANSVILLE, Indiana
Southern Indiana Gas & Electric Co.
FALL RIVER, Massachusetts
Fall River Gas Works Company
FREDERICK, Maryland
City of Frederick Water Dept.
FREDERICK, Maryland
Frederick Gas Company, Inc.
CITY OF FREDERICKSBURG, Virginia
Gas Department
HALIFAX, Nova Scotia
Public Service Commission, Public Water Supply
HARTFORD, Connecticut
The Hartford Gas Company
HARTFORD, Connecticut
Water Bureau of the Metropolitan District
HUNTSVILLE, Alabama
Municipal Water Works
INDIANAPOLIS, Indiana
Citizens Gas & Coke Utility
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Knoxville Utilities Board (Gas)
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Bureau of Water
LOUISVILLE, Kentucky
Louisville Gas & Electric Co.
LYNCHBURG, Virginia
City of Lynchburg Water Dept.
MADISON, Indiana
Natural Gas Service, Inc.
*MEDIA, Pennsylvania
Philadelphia Electric Company Gas Dept.
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Municipal Authority, Borough of Minersville
MOBILE, Alabama
Mobile Gas Service Corp.
MOBILE, Alabama
Mobile Water Works Company
MONTREAL, Quebec
Quebec Hydro-Electric Commission
MONTREAL, Quebec
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Pennichuck Water Works
NASHVILLE, Tennessee
Waterworks Department
NEW BRUNSWICK, New Jersey
Public Service Electric & Gas Co.
NEW HAVEN, Connecticut
New Haven Gas Company
NEW ORLEANS, Louisiana
New Orleans Public Service, Inc. (Gas)
NEWARK, New Jersey
Public Service Electric & Gas Co.
NEW YORK, New York
Dept. of Water, Gas & Electricity
NORRISTOWN, Pennsylvania
Philadelphia Electric Co., Gas Dept.
PAINESVILLE, Ohio
City of Painesville, Gas District Dept.
PEORIA, Illinois
Central Illinois Light Company
PHILADELPHIA, Pennsylvania
Department of Public Works, Bureau of Water
PHILADELPHIA, Pennsylvania
Philadelphia Gas Works Co.
PITTSBURGH, Pennsylvania
Bureau of Water, Department of Public Works
PLYMOUTH, Massachusetts
Plymouth Gas Light Company
POTTSVILLE, Pennsylvania
Pottsville Water Company
PROVIDENCE, Rhode Island
Providence Gas Company
QUEBEC, Canada
Quebec Power Co., Gas Division
READING, Pennsylvania
Bureau of Water
RICHMOND, Virginia
Department of Public Utilities (Gas)
RICHMOND, Virginia
Department of Public Utilities (Water)
ROCHESTER, New York
Rochester Gas & Electric Corp.
SACRAMENTO, California
Division of Water & Sewers
ST. JOHN, New Brunswick
Water & Sewerage Department
ST. LOUIS, Missouri
Dept. of Public Utilities, Water Div.
SALEM, Massachusetts
North Shore Gas Company
*SAVANNAH, Georgia
South Atlantic Gas Company
SPRINGFIELD, Illinois
Central Illinois Light Company
SYRACUSE, New York
Water Div., Dept. of Engineering
TORONTO, Ontario
The Consumer's Gas Co. of Toronto
TROY, New York
Department of Public Works
UTICA, New York
City of Utica, Board of Water Supply
WHEELING, West Virginia
City of Wheeling Water Department
*WILLIAMSPORT, Pennsylvania
Williamsport Municipal Water Authority
WILMINGTON, Delaware
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Water Department
YORK, Pennsylvania
York Water Company
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Water Department

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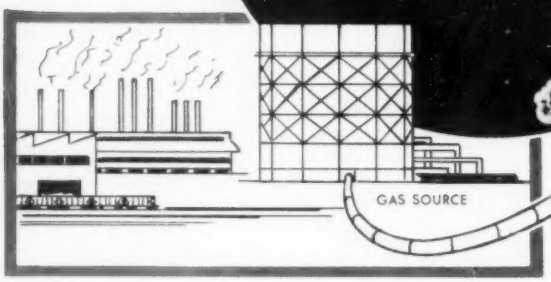
MANAGING DIRECTOR

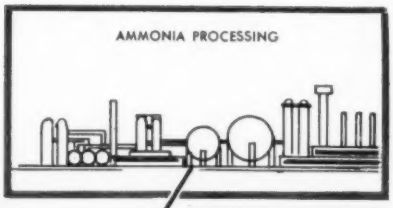
CAST IRON

122 SOUTH MICHIGAN AVENUE, CHICAGO 3, ILLINOIS

In Gas Service...

American for an American "First"





American Double-X Mechanical Joint Pipe, centrifugally cast in 20-foot lengths, will carry coke-oven gas to the first ammonia plant of its kind in America.

The first plant in America which will produce ammonia from a coke-oven gas base will soon be in operation. Long-lasting, *quality* cast iron pipe was selected for the important gas supply line.

American 16-inch Double-X Mechanical Joint Pipe will conduct 17,500,000 cubic feet of coke-oven gas per day to this plant from a source two miles away. Because of plant and source locations, numerous installation problems were met.

Besides the problem of heavy dolomitic limestone in the line route, the additional problems of a creek crossing, and a railroad crossing with an eight-hour time limit for pipe installation were faced. Installation of three pipe lines in one trench helped solve these problems.

American Cast Iron Pipe Company research and facilities are helping solve piping problems in many of today's growing industries and communities. Get our recommendations when you plan *your* installation.

AMERICAN CAST IRON PIPE CO.
BIRMINGHAM 2, ALABAMA

SALES OFFICES
New York • Chicago
Cleveland • Minneapolis
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San Francisco • Denver
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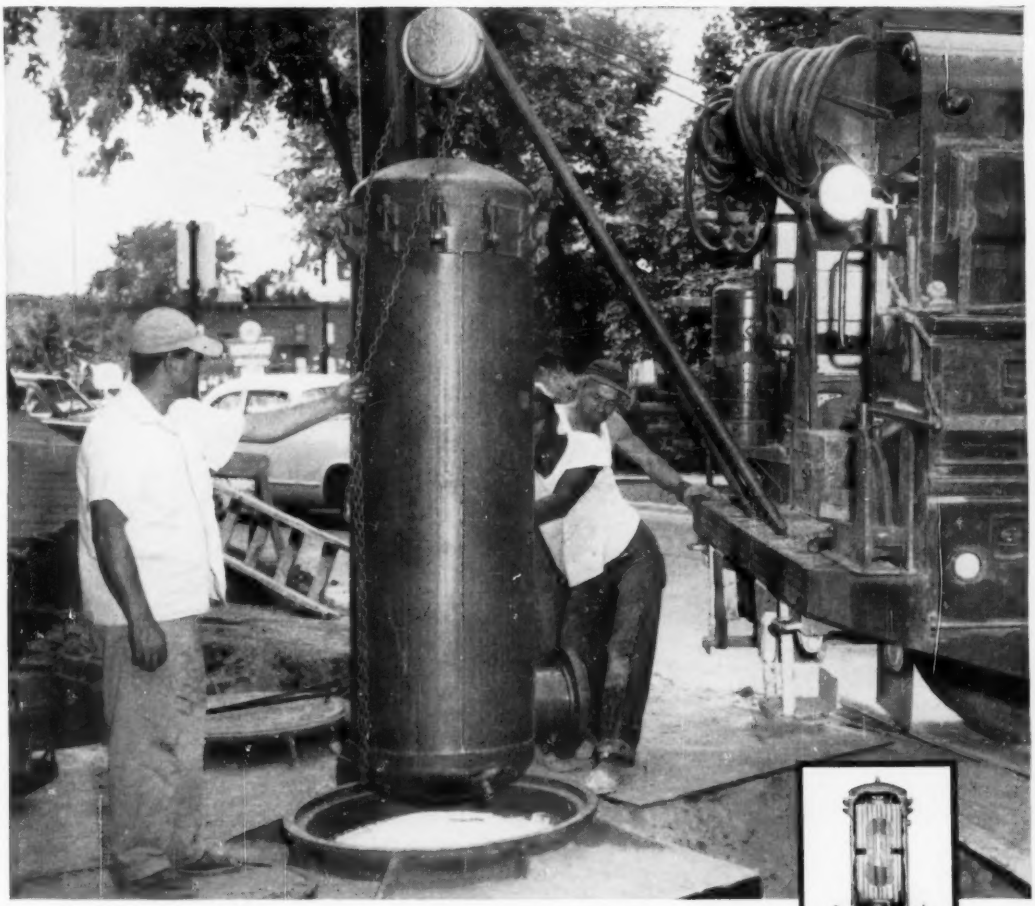
PROTECTOMOTOR STAYNEW FILTERS FOR EVERY INDUSTRIAL AND VENTILATING NEED



Model CPHG Gas Filter

HOW RG&E CURED A DUST PROBLEM

Dust in a gas-distribution system soon causes an alarming number of customer complaints about clogged pilots. This happened to the Rochester Gas & Electric Corporation when they converted from manufactured to natural gas.

After trying various ways to eliminate the dust problem, R G & E settled on a Model CPHG Dollinger Staynew Gas Filter installed ahead of the district regulator. A filtering material was selected which removes particles smaller than two microns.

Complaints dropped off sharply; and since 1950 R G & E has installed 100 Staynew Gas Filters. They are inspected once a year and normally contain about a pint of dust, a fact which emphasizes how minute are the dust particles which can cause "clogged pilots."

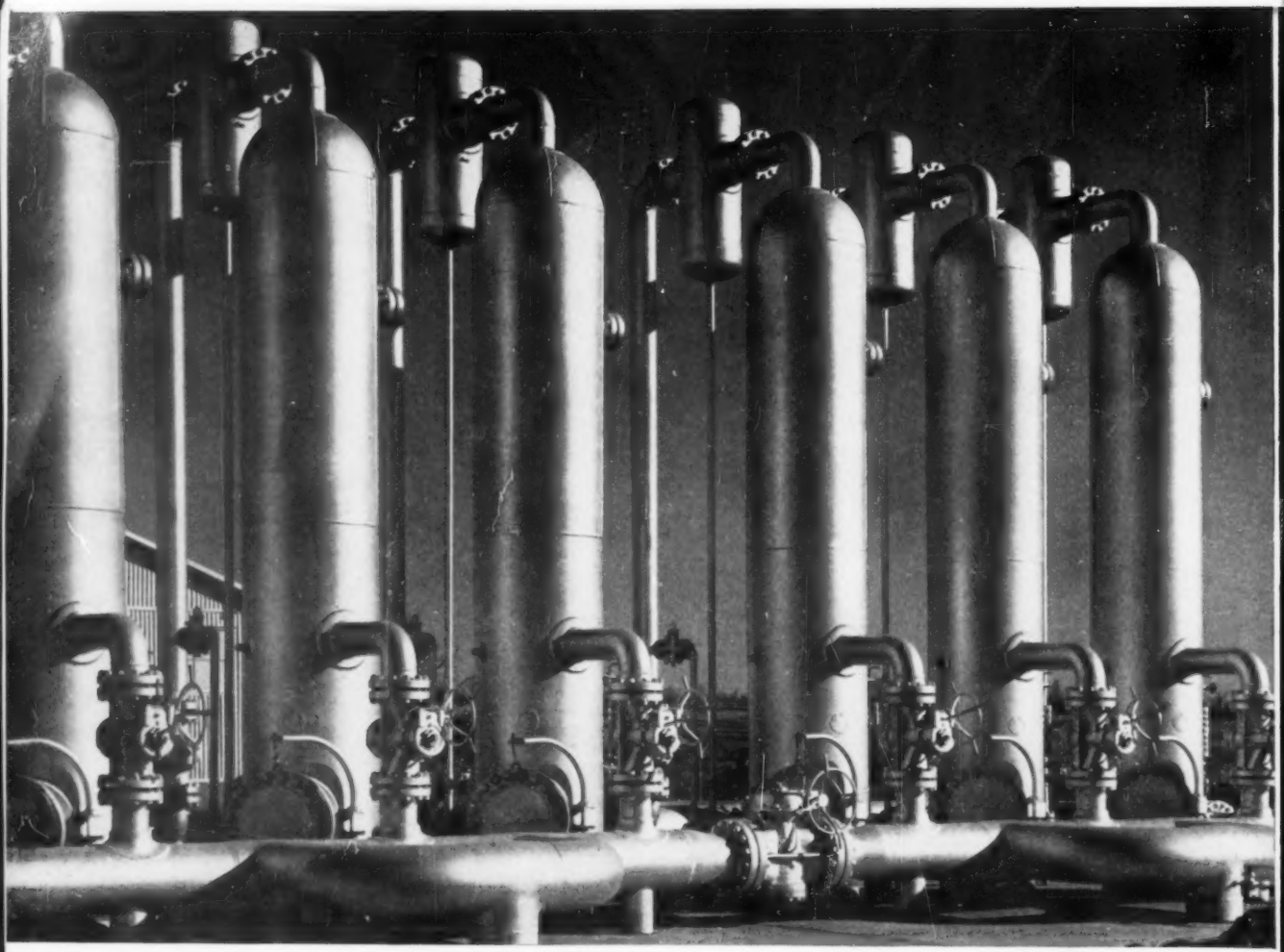
Dollinger Staynew Gas Filters were selected by R G & E because, (1) their radial fin design results in lowest resistance to flow, (2) eliminates frequent cleaning, (3) is easy to reach and inspect, (4) permits dry scrubbing, (5) is small and light in relation to capacity, and (6) is adaptable to almost any capacity.

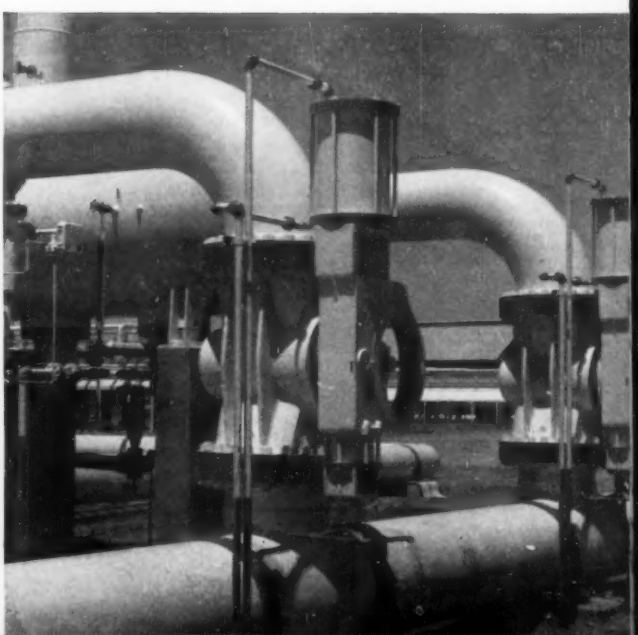
Write for complete details in Bulletin 290.
Dollinger Corporation, 68 Centre Park, Rochester 3, N. Y.

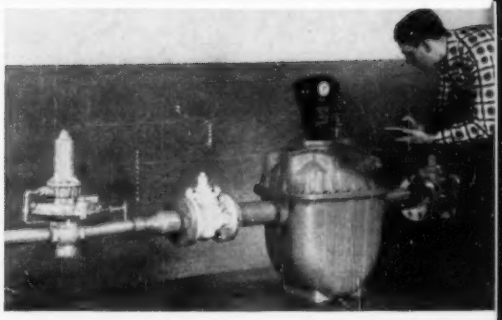
REG. PROTECTOMOTOR U.S. PAT. OFF.

STAYNEW DOLLINGER FILTERS

LIQUID FILTERS • PIPE LINE FILTERS • INTAKE FILTERS • HYDRAULIC FILTERS • ELECTROSTATIC FILTERS • MIST COLLECTORS • DRY PANEL FILTERS • SPECIAL DESIGN FILTERS • VISCOUS PANEL FILTERS • LOW PRESSURE FILTERS HIGH PRESSURE FILTERS • AUTOMATIC VENTILATION FILTERS • NATURAL GAS FILTERS • SILENCER FILTERS







Why you always see ROCKWELL-Nordstrom VALVES Everywhere there's GAS

Rockwell-Nordstrom valves are used in more gas services than any other valves. The reason: Pressurized lubricant sealing for leak-proof safety . . . quarter-turn, instant operation . . . unexposed seating . . . and lubricant protection for long, low-cost service life. You can't get these features in ordinary valves at any price, yet Rockwell-Nordstrom valves cost no more to buy, often less.

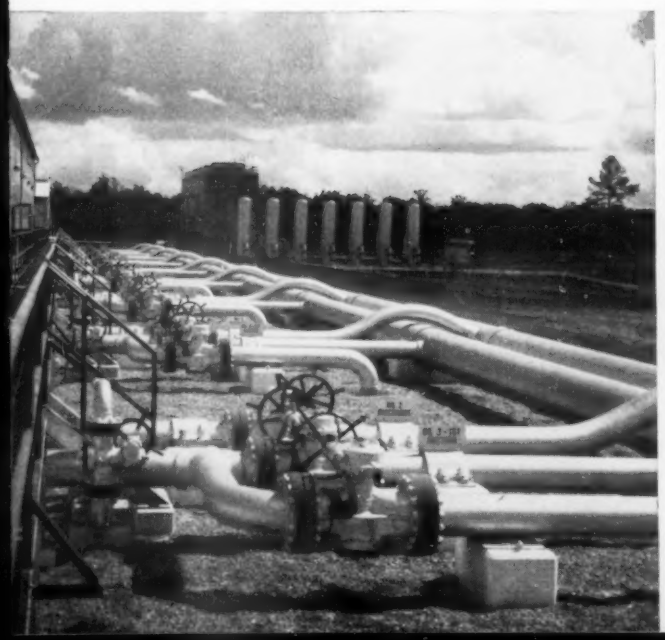
Rockwell-Nordstrom valves are available in sizes to 34″ and pressures to 10,000 lbs., for gas production, transmission or distribution services. For more information, see your nearest distributor or write: Rockwell Manufacturing Company, Pittsburgh 8, Pennsylvania.

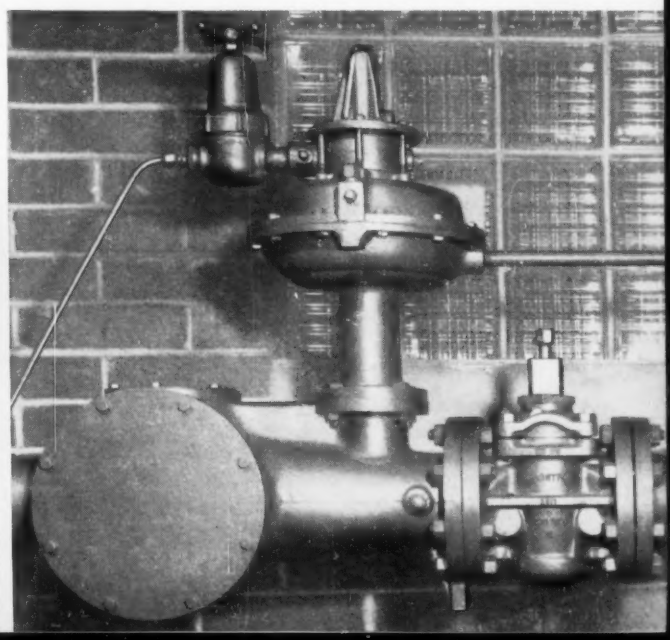
Canadian Valve Licensee: Peacock Brothers Limited.

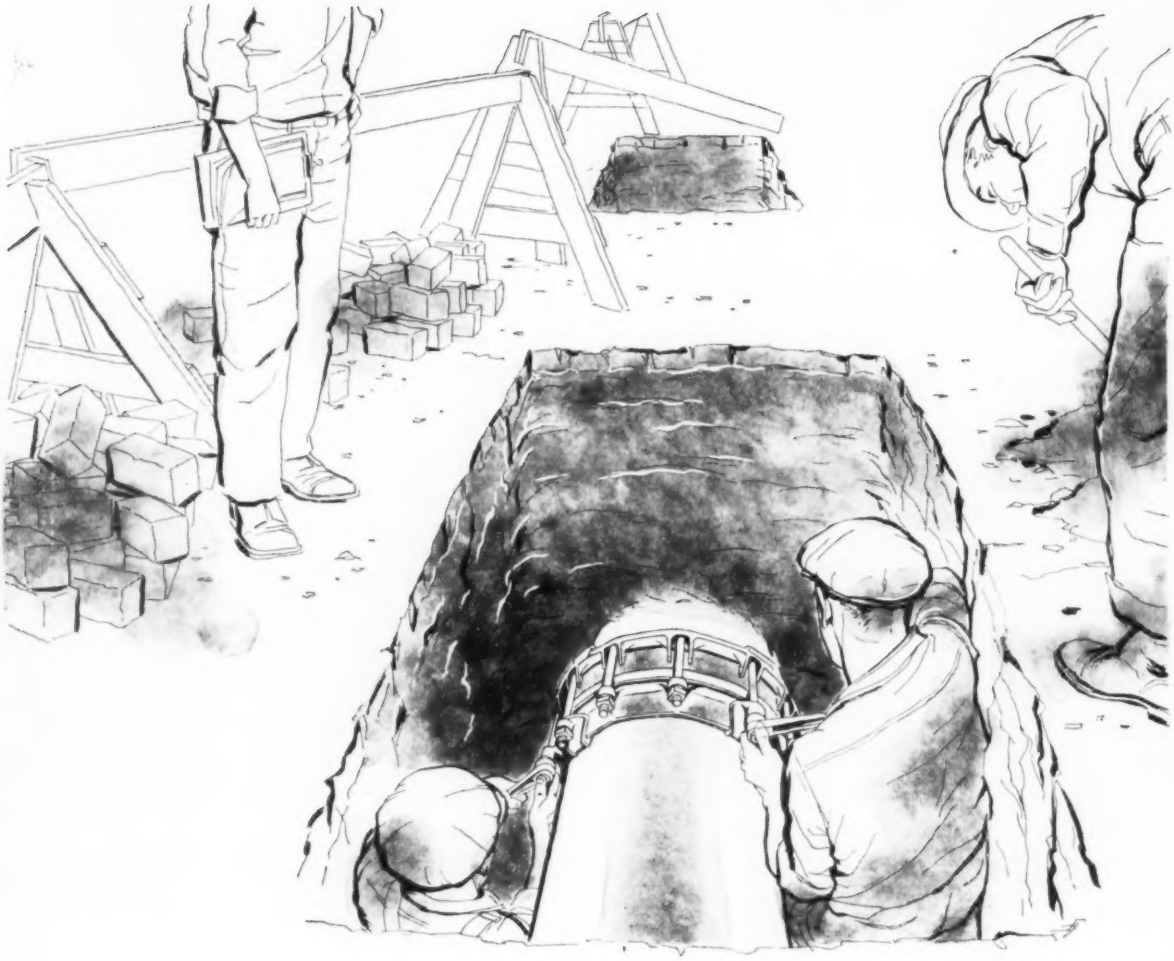
Be sure and see Playhouse 90, A.G.A. sponsored TV program. Check your local paper for time and station.

ROCKWELL-Nordstrom VALVES

Lubricant Sealed for Positive Shut-Off







PERMANENCE COSTS SO LITTLE

. . . doing it the Dresser way!

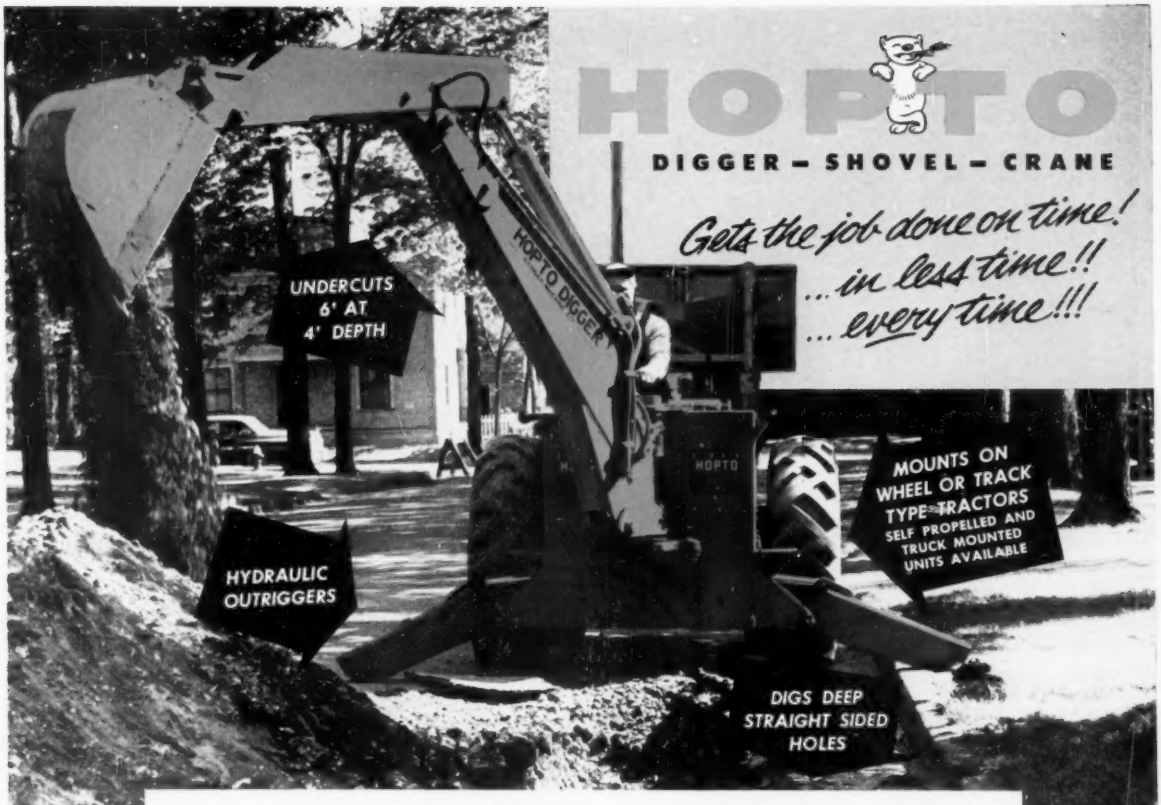
Now you can build new line safety into all old cast iron bell-and-spigot joints . . . quickly and at lowest cost . . . using leakproof Dresser Style 60 Bell Joint Clamps.

Whenever you boost pressures, change over to natural gas, or uncover bell-and-spigot joints for *any* reason, install these Dresser Clamps. They are gastight, have resilient rubber gaskets that absorb pipe movement, vibration and other line stresses *without leakage.* Their strong, balanced construction insures uniform gasket pressure at all points and a joint that stays maintenance-free for life.

A full-color, step-by-step training film which shows the correct way to clamp in all situations is available for gas companies. Contact your local Dresser representative or write us to arrange a showing for your service people.

DRESSER® ONE OF THE DRESSER INDUSTRIES **FITTING PARTNER FOR THE GAS INDUSTRY**

Dresser Manufacturing Division, 59 Fisher Ave., Bradford, Pa. Warehouses: 1121 Rothwell St., Houston; 101 S. Airport Blvd., S. San Francisco. Sales Offices also in: New York, Philadelphia, Chicago, Atlanta, Denver. In Canada: Toronto, Calgary.


HOPTO
DIGGER – SHOVEL – CRANE
Gets the job done on time!
... in less time!!
... every time!!!
UNDERCUTS 6' AT 4' DEPTH
HOPTO DIGGER
HOPTO
MOUNTS ON WHEEL OR TRACK TYPE TRACTORS
SELF PROPELLED AND TRUCK MOUNTED UNITS AVAILABLE
HYDRAULIC OUTRIGGERS
DIGS DEEP STRAIGHT SIDED HOLES

FAST CYCLING . . . HYDRAULICALLY OPERATED

Dig clean, straight-sided holes up to 10′ deep . . . trench for service connections or mains . . . backfill . . . handle materials and supplies for line and plant construction . . . undercut walks, curbs and other utility installations. You can handle all these jobs and many more with HOPTO, the easier-to-handle Digger-Shovel-Crane! !

HOPTO cycles fast with safety! So simple that even your unskilled labor can handle and easily do the work of sixteen men! No cables or pulleys. HOPTO is *completely* hydraulic!

Retractable hydraulically operated outriggers quickly level unit on any terrain! Smooth, even, *tremendous* hydraulic force bites in to compacted and blacktop roads . . . economically handles all soil and digging conditions.

A wide variety of widths in back-hoe and shovel-buckets are available for models illustrated and for the additional self-propelled and truck-mounted units Badger builds. HOPTO is the low-cost, versatile unit that does *more* jobs in *less* cost with *lower equipment investment!*

BADGER ALSO BUILDS A COMPLETE LINE OF CONTINUOUS TRENCHERS

Write today for complete information!

BADGER MACHINE CO.

DEPT. 29 • WINONA, MINNESOTA

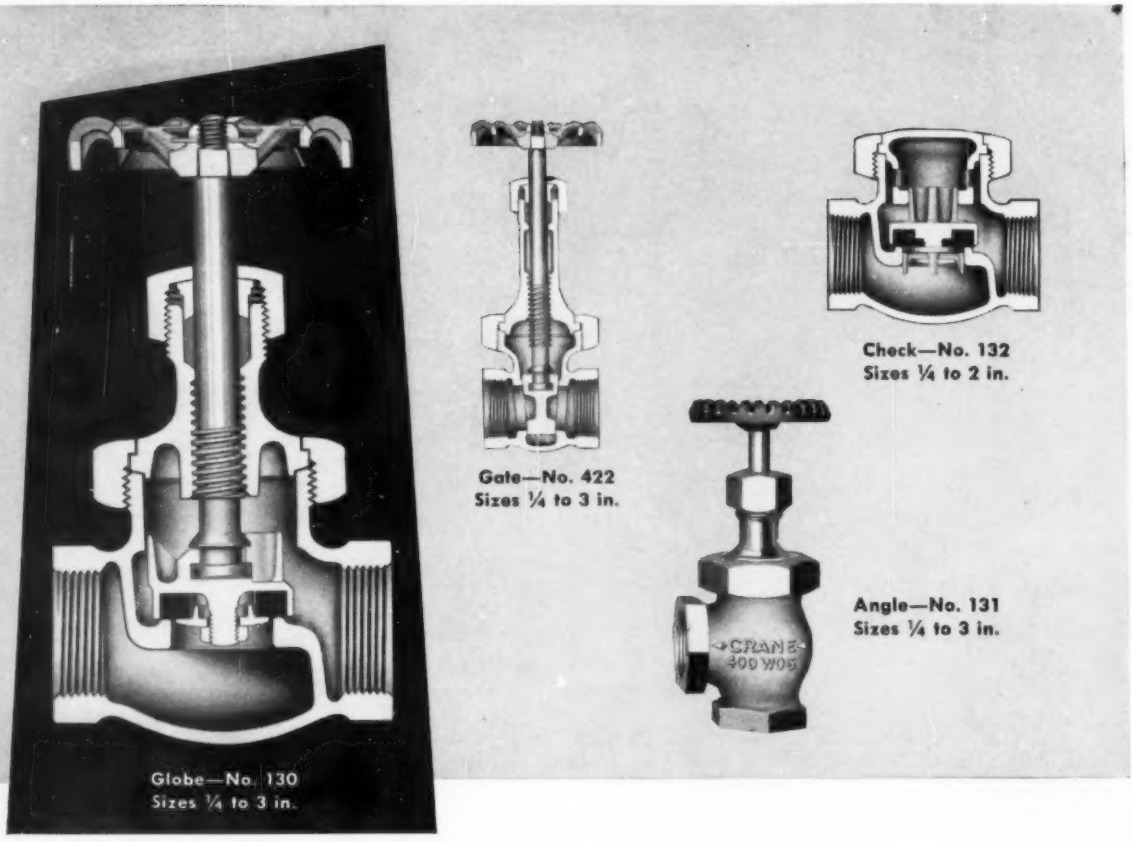
MODEL 185 SPR

Standard HOPTO mounted on a self-propelled wheel-type unit.

½ YD.! 360° SWING!

MODEL 360

A half-yard truck-mounted unit. Operator's cab swings with boom. One-fourth-yard model 200 DTM for truck mounting also available.



Whether liquid or gaseous— handling LP-gas is safer with CRANE Bronze Valves

With Crane Bronze Valves on your storage tanks, tank trucks, and in service piping—you'll reduce the hazards of handling LP-gases to a new low.

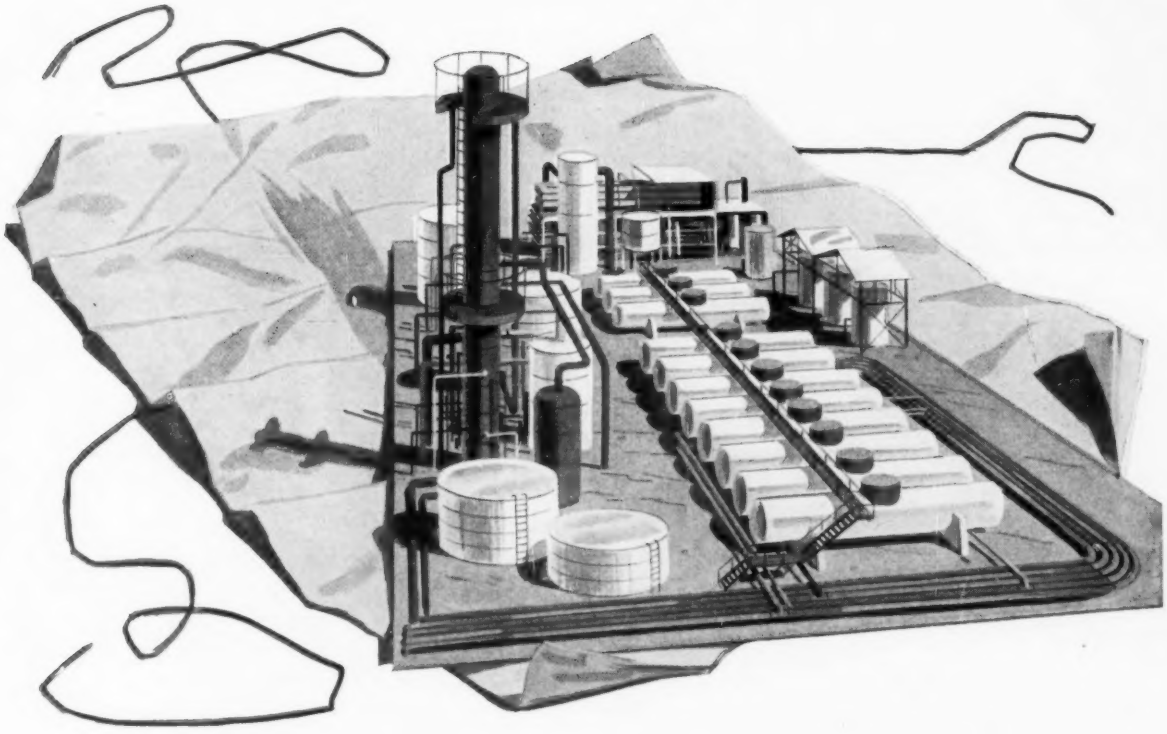
Here are valves developed specifically for handling all LP-gases, whether in the liquid or gaseous state. The Crane globe, angle and check valves, for example, have a specially formulated composition disc that seats with absolute tightness, yet withstands hardest wear. And for double insurance against any internal leakage, this special Crane No. 6 disc is permanently cemented into the disc holder.

You'll find the complete line of these Crane Bronze Valves at your local Crane outlet, including globe, angle, gate and check patterns. Each pattern is designed and constructed to help you do a better, safer job of LP-gas handling. See your local Crane Representative today for details, or write to address below.

CRANE VALVES & FITTINGS

PIPE • KITCHENS • PLUMBING • HEATING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers in All Areas



NEW PLANT—*NOW on stream*

making a sulfide odorant at a mercaptan price!

Oronite
CALODORANT
B-1

Oronite now has greatly expanded production capacity on gas odorants. With the new Calodorant B-1 manufacturing facilities, Oronite is more than ever the leading producer of quality gas odorants.

Oronite Calodorant B-1 is a mixed sulfide having a relatively narrow boiling range, possessing excellent oxidation and thermal stability. New Calodorant B-1 has been thoroughly tested and proved in commercial gas utility lines over the past two years.

Now is the time to evaluate Calodorant B-1 in your own system—sample quantities are available for your testing purposes. Just contact the Oronite office nearest you for complete information.

ORONITE CHEMICAL COMPANY

EXECUTIVE OFFICES: 200 Bush Street, San Francisco 20, California

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450 Mission Street, San Francisco 5, Calif.
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EUROPEAN OFFICE

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6049

Announcing the all new 4/10 yard, 8½ ton

85A "QUICK-WAY"®...

When you can make money with a small outfit, think how much more money you can make with the husky *"QUICK-WAY"* 85A. Why be satisfied with a 6 or 7 tons in the 3/8 yard class when you can get 8½ tons in the 4/10 yard *"QUICK-WAY"* 85A—and for approximately the same price.

The new *"QUICK-WAY"* 85A has more Big Shovel Features than any other in the small shovel field.

It has been engineered to meet rugged, heavy-duty specifications with fewer moving parts. The power train is oversize, all shafts are splined for easy maintenance. Extra strength has been built in the machinery frame and gantry for greater lifting power.

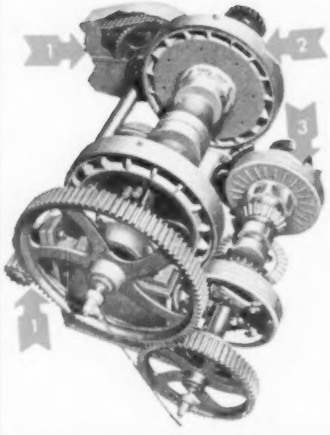
For the owner, the *"QUICK-WAY"* 85A is a quality machine, designed to deliver more efficient performance per pound and per dollar than many more costly machines.

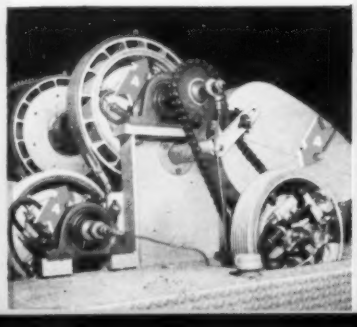
For the operator, the *"QUICK-WAY"* 85A has been simplified for easy, economical maintenance of all parts. It operates smoothly and quietly for maximum production and minimum operator fatigue.

You owe it to yourself to see the new *"QUICK-WAY"* 85A before you buy any shovel at any price. See your distributor for a demonstration and get the real facts on how you can make more money with the husky *"QUICK-WAY"* 85A.

"QUICK-WAY"® TRUCK SHOVEL CO.
A Pres-Tex Subsidiary DENVER, COLORADO

THE ONE SMALL



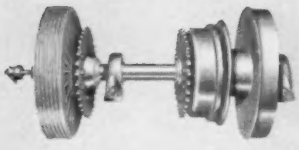


1. **SIMPLIFIED CHAIN AND GEAR DRIVE** for efficient, quiet operation—the combination of roller chains and precision machined gears gives efficient transmission of power through the minimum number of moving parts. This simple, efficient design provides quiet, low-maintenance operation. Stand. engine 47 HP @ 1800 rpm.
2. **MAIN HOIST AND HAUL BACK DRUMS**—are mounted on a single, accessible shaft with sealed anti-friction bearings. Two-piece cast laggings are easily changed for different operations. Large clutch and brake drums have separated surfaces with louvres for cooling.
3. **LARGE SWING DRUMS** are ribbed for cooling—and are mounted on a king-sized horizontal swing shaft. Swing brakes are optional. Vertical swing shaft is mounted in double anti-friction bearings at top with an anti-friction needle roller bearing at bottom. One-piece, bonded brake linings provide more surface for smoother, cooler operation.
4. **OVERSIZE CLUTCHES** have more surface—for smoother, positive action. All clutches are hydraulically operated for easy, sure application of power. Hydraulic clutch controls operate with minimum effort and give the operator the feel of the load at all times.

. . . and the all new "QUICK-WAY" CRAWLERS 85 AC & 105 AC

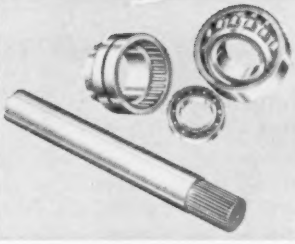
Now you can get the ***"QUICK-WAY"*** 85A and 105A on a crawler! You get the same ***"QUICK-WAY"*** Big Shovel Features on the crawler that gets to its job, stays with the work, even in close, restrictive quarters. The new ***"QUICK-WAY"*** Crawler has independent travel—forward and reverse speeds of 7/8 miles per hour in low range and 1-3/4 miles per hour in high range. It is now available in 16" crawler shoes (5.1 psi ground pressure), 24" crawler shoes (3.5 psi ground pressure), and 32" crawler shoes (2.5 psi ground pressure). Width of 95" has been especially designed for hauling on trailers.

SHOVEL WITH BIG SHOVEL FEATURES

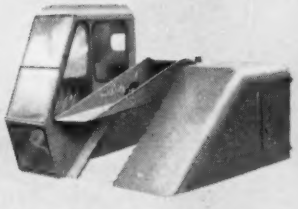


POWER UP AND DOWN BOOM HOIST IS STANDARD — A simple precision design makes safe, sure operation. A one-piece cast steel unit contains pawl teeth, windlass and brake drum. The cable end is located in an easily accessible place for quick attachment change-over.

ONE-PIECE FLOOR FRAME, HEAVY DUTY SWING TABLE GEAR AND HOOK ROLLERS—Floor frame electric welded in jig, then all bearing mounts machined at one time for precision alignment. One-piece, cast steel swing table gear. Four hook rollers distribute load.



ALL SHAFTS SPLINED, ALL ANTI-FRICTION BEARINGS — All shafts extra large for maximum strength, precision splined for easy maintenance. Anti-friction bearings used on all high-speed, continuous rotating shafts and drums. All shaft bearing surfaces are precision ground.



MACHINERY HOUSING DESIGNED FOR COMPLETE, EASY ACCESS—to all machinery. New feature is an automobile hood-type cable trough cover that lifts high for complete access to central machinery. New cab has 360° vision through removable safety-glass windows.

THE MOST COMPLETE LINE . . . WITH 5 MODELS IN THE SMALL SHOVEL FIELD!

105A & 105AC
5/10 YD., 10½ TONS

125A
6/10 YD., 12½ TONS

with the famous money-making line of "QUICK-WAY" attachments for all models.

Get these important books . . . free!

- ☐ The new catalog on the *"QUICK-WAY"* 85A and 85AC Crawler.
- ☐ The new catalog on the *"QUICK-WAY"* 105A and 105AC Crawler.
- ☐ The new catalog on the *"QUICK-WAY"* 125A.

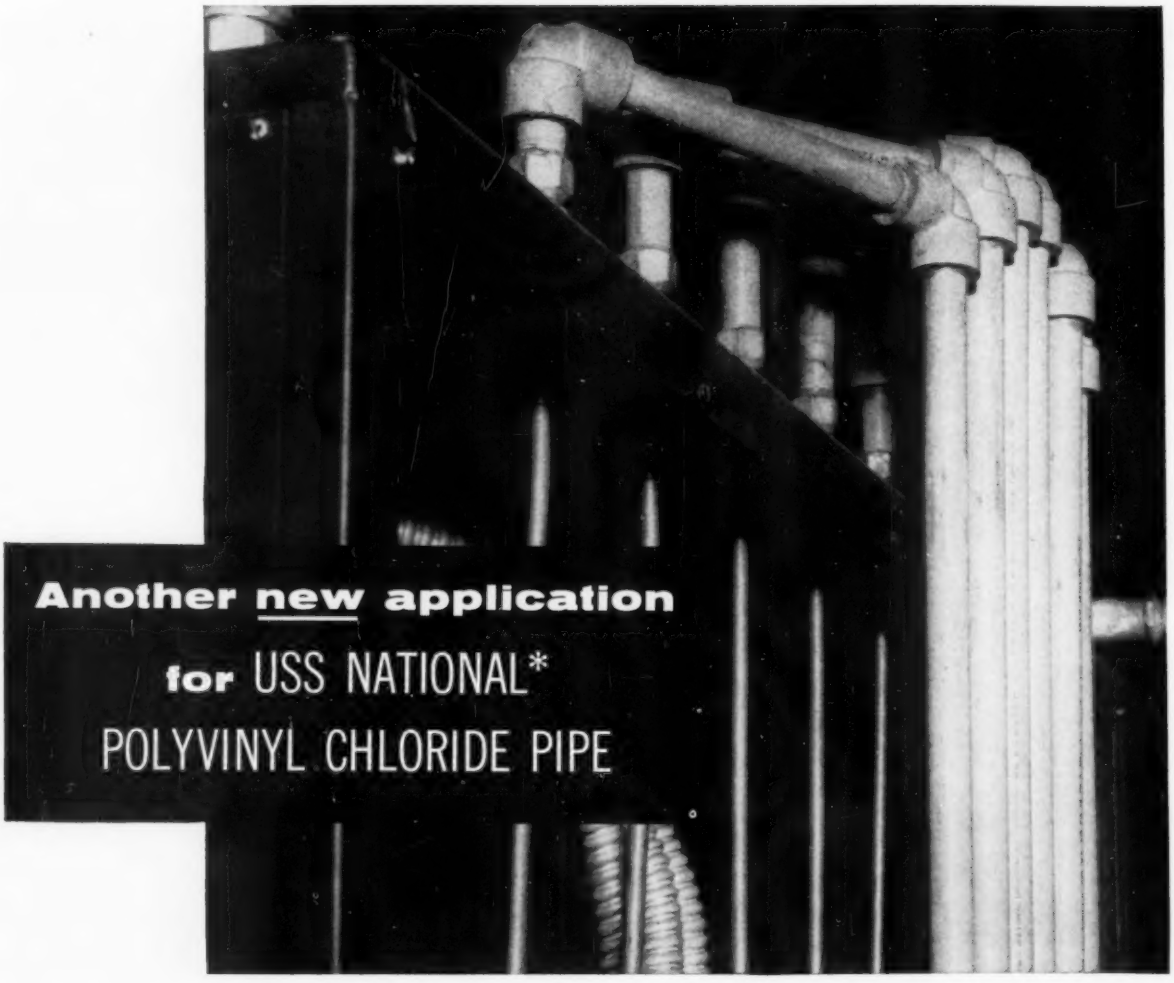
"QUICK-WAY" TRUCK SHOVEL CO., Dept. 107
2401 East 40th Ave., Denver 5, Colorado, U.S.A.

Name.....*Title*.....

Company.....

Address.....

City and State.....



. . . carrying blast furnace gas

Here's another example of the versatility of NATIONAL PVC Pipe. Used as part of a gas detection system in a boilerhouse-power station, the high-impact pipe transports blast furnace gas at temperatures up to 100°F., from the furnaces to the testing laboratory. Approximately 14,000 feet of NATIONAL Polyvinyl Chloride Pipe were used in this installation. And it has proved ideal for the job.

Polyvinyl Chloride, the "stainless" of plastic pipe materials, is tough and rigid, immune to acids, alkalis, salts, fungi, bacterial action and soils, as well as a multitude of chemicals. It won't corrode. It will carry just about anything—wet or dry natural gas, oil, chemicals.

NATIONAL PVC Pipe may be coupled by solvent cementing, threading, heat welding, or adhesives. And it can be used in overhead installations with pipe supports.

Two types of NATIONAL PVC Pipe are available in sizes ½-inch to 6-inch inclusive, and in Schedules 40, 80 and 120.

NORMAL IMPACT—for installations requiring the highest chemical resistance attainable, together with high strength and excellent creep resistance.

HIGH IMPACT—for installations requiring excellent chemical resistance and a high degree of toughness even at low temperatures.

**Trademark*

A bulletin on National PVC Pipe is available free of charge. Write to National Tube Division, United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa.. Ask for Bulletin 24.

NATIONAL TUBE DIVISION, UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

This seal of the National Sanitation Foundation is carried on all USS National Polyvinyl Chloride Pipe and means—Tested . . . Approved . . . Sanitary!

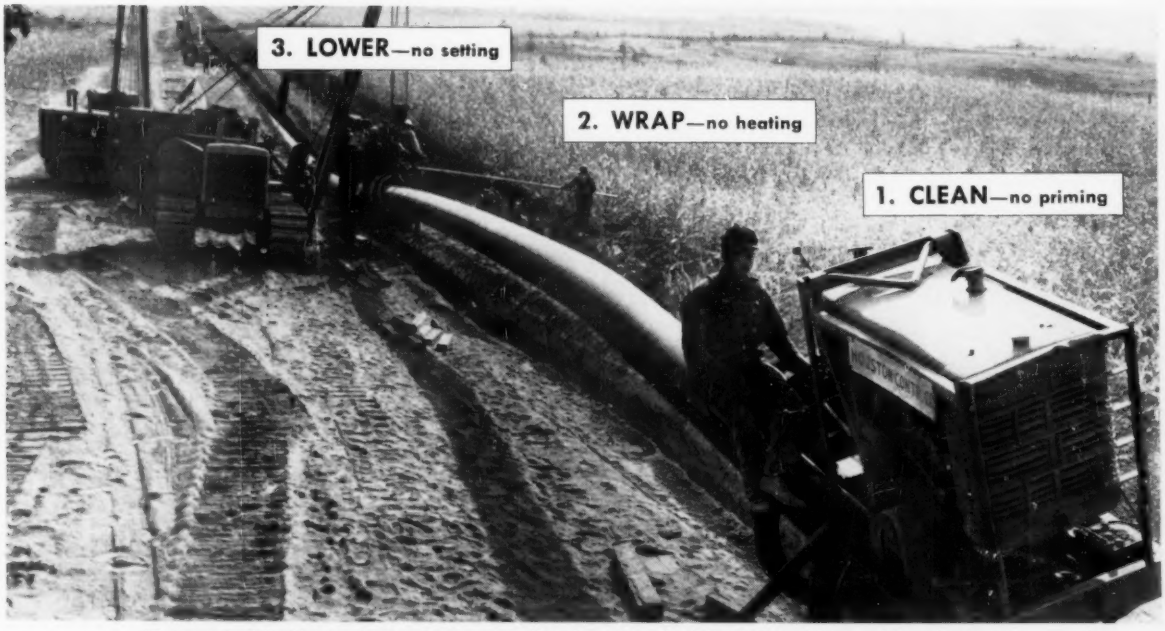
NATIONAL PVC PIPE

UNITED STATES STEEL

THE BIG NEWS OF THE YEAR

The tape that takes the problems out of pipe coating

(THE ORIGINAL POLYETHYLENE TAPE BY POLYKEN)



Photograph of the Houston Contracting Co. spread on American-Louisiana's 122-mile lateral from Defiance, Ohio, to Bridgman, Michigan. Houston operated under a joint contract with the H. C. Price Co.

Pipe line companies and contractors are discovering all these cost-cutting advantages of Polyken Tape:

1. Tremendous labor and equipment savings because of simplified operation.
2. Faster coating—consistent high daily output.
3. No hot dope preparation—tape is ever ready.
4. No cooling or drying time.
5. Vastly reduced warehousing, shipping, handling costs.
6. Liabilities virtually eliminated—no fumes, no burns, no need to worry about human and livestock hazards.
7. Wrap goes into ground in factory-uniform condition.

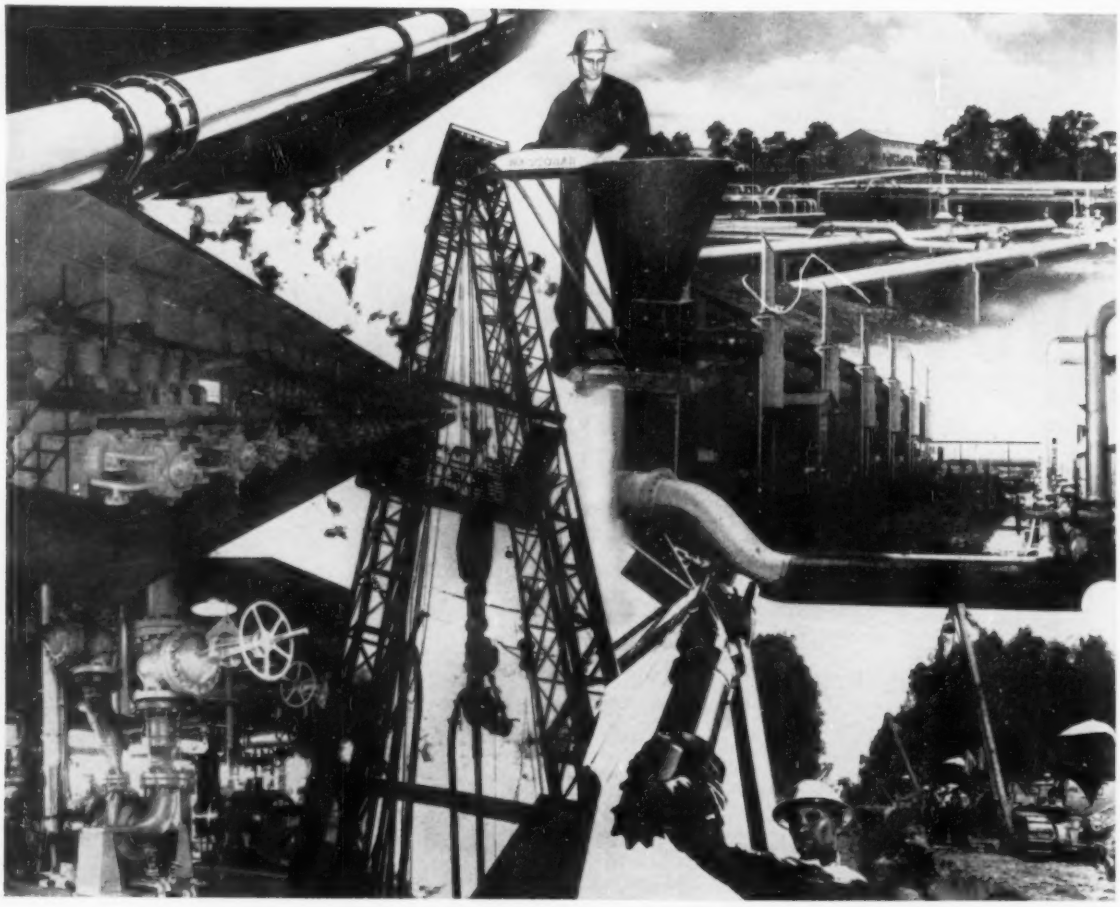
Also ideally suited for above and below ground small-diameter applications, elbows and compressor station protection.

To talk over your project—write, wire or phone *Polyken Sales Division*, 309 W. Jackson Blvd., Chicago 6, Illinois. Webster 9-7100.

Complete catalog, Sweet's Industrial Construction File, Sec. 3J/Ke

Polyken® **PROTECTIVE COATINGS**

The Kendall Company, Polyken Sales Division



Tomorrow's Progress Planned Today

ONE OF THE DRESSER INDUSTRIES

look for this symbol

. . . it identifies all Dresser Companies and their products

THE DRESSER INDUSTRIAL TEAM SERVES THE GROWING OI

the Dresser Badges of Merit plus+

CLARK

CLARK BROS. CO., Olean, New York —Gas turbines, engines, and reciprocating, centrifugal and axial flow compressors—gas, steam, electric and diesel driven.

DRESSER IDECO

DRESSER-IDECO COMPANY, Columbus, Ohio—Radio and television broadcasting towers, steel buildings, aircraft hangars, electric power substations.

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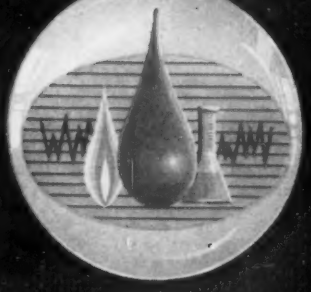

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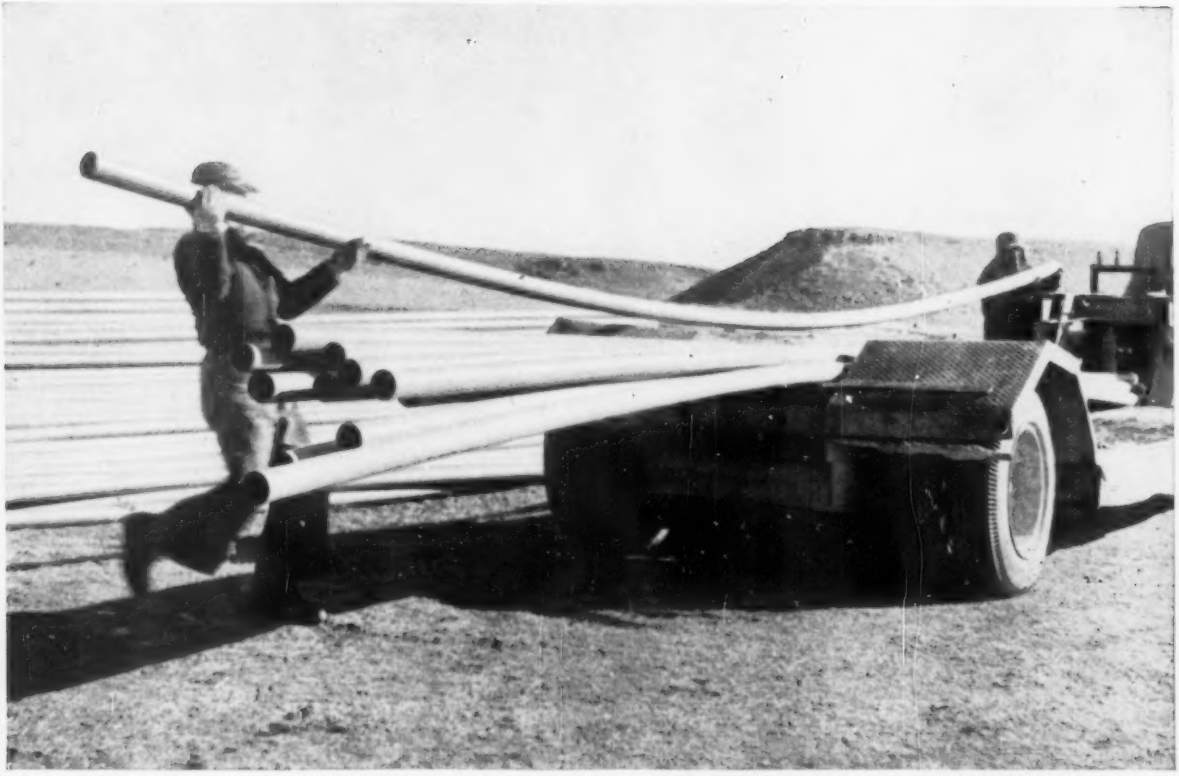

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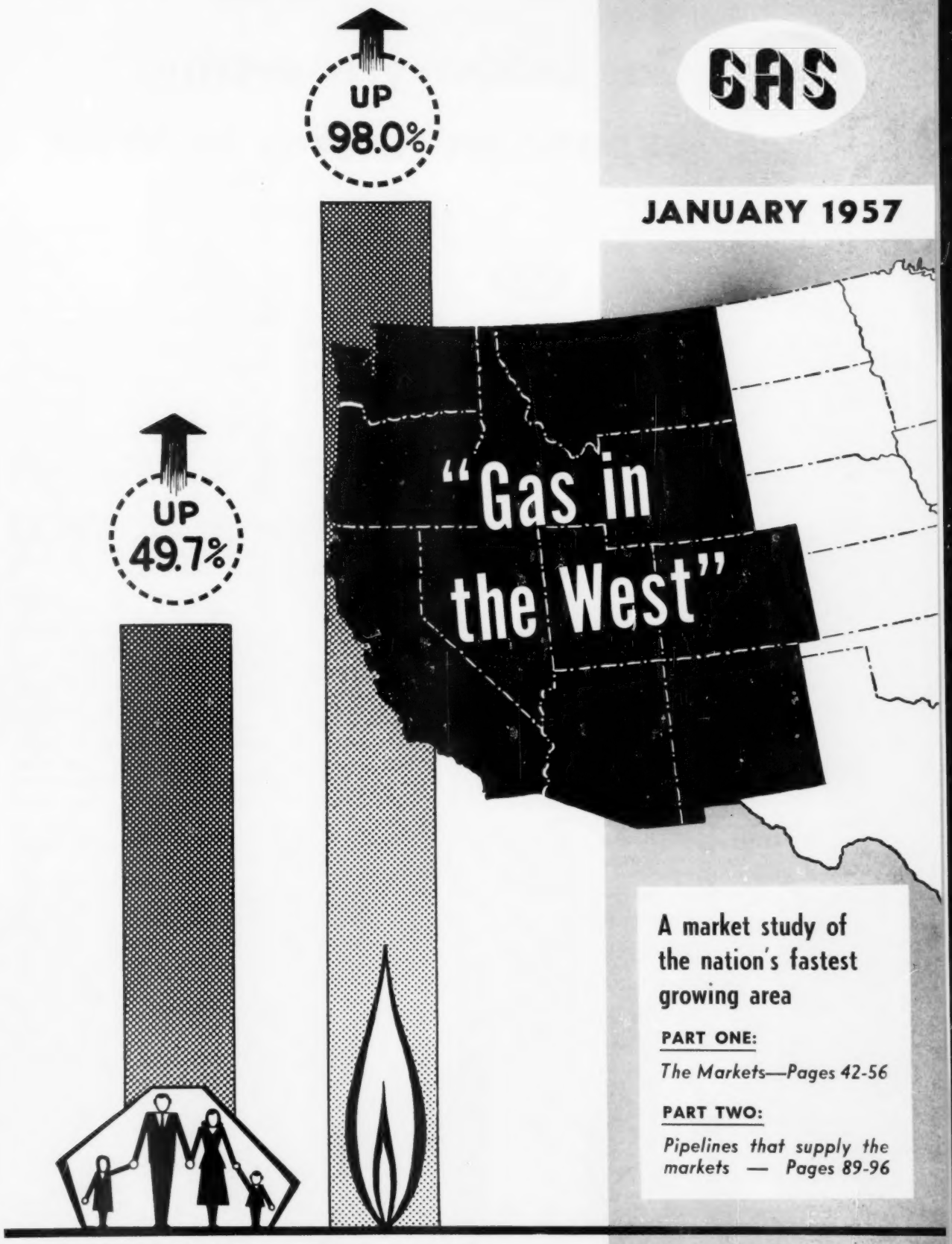


"Gas in the West"

A market study of the nation's fastest growing area

PART ONE:

The Markets—Pages 42-56

PART TWO:

Pipelines that supply the markets — Pages 89-96

Gas industry is setting expansion records in West

THE gas industry is setting expansion records out West because (1) there is room to expand, (2) there is, laconically, a great popular and industrial migration westward, and (3) the industrial potential of the 11 western states is asserting its development—in some states, for the first time.

To the gas industry, it means growth. Growth, in turn, means market. The West offers market for (1) increasingly large volumes of natural gas, (2) domestic appliances, (3) gas-fired industrial equipment that can fill the need for applying energy to product, and (4) market for all the tools and material required by expanding gas companies. Growth also means progress to the gas industry. Progress in construction and operating techniques as more efficient methods are sought to economically render expanding gas service.

Western gas companies will be sending out an estimated volume of 1.7 trillion cu ft during the year 1960. At the end of 1955, the sendout for the year was 1.2 trillion. In 1951, the sendout for the West was 0.87 trillion cu ft. The

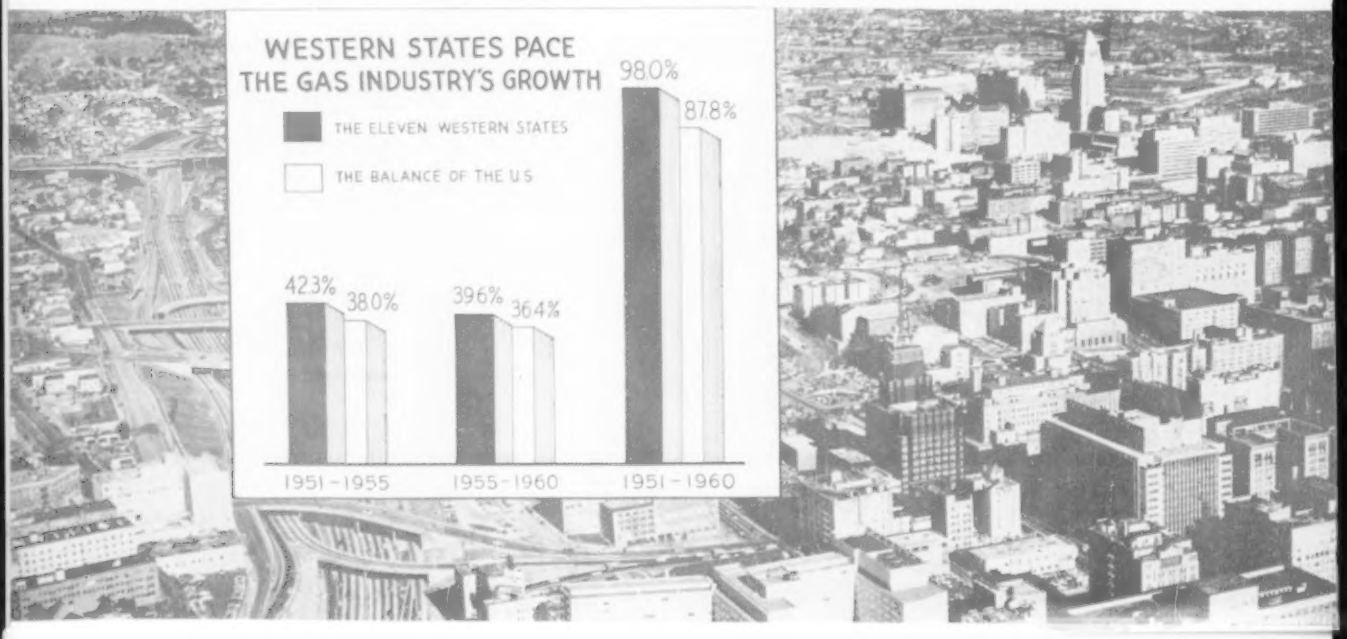
GAS market study

data on the chart below show the growth of sendout volume in the western states as compared with that for the remainder of the United States.

To install the pipelines, mains, handling stations, compressor plants, and related facilities to deliver these increased volumes of natural gas to consumers in the western states, gas companies operating in the West will spend at least $933 million between now and the end of 1960. These expenditures are matters of record as of now. There are other plans in the formative stages that will raise this figure well over the $1 billion mark before the end of 1960 is reached.

The West will pioneer new developments in domestic gas appliances. Already, there has been a definite upsurge in demand for industrial gas equipment in Idaho, Oregon, and Washington in direct reaction to the new natural gas pipeline completed into these states. The other states of the West also report sales of gas industrial equipment in swinging up. Industry in western states other than California, Oregon, and Washington tends to be of a relatively small, but vital, nature. These small firms may purchase only a few thousand dollars worth of industrial equipment, but this gas-fired part of their operations may play a most vital part in their production process. Such companies are apt to turn out custom-type products worth millions.

From the long-range point of view, the problem facing the gas companies serving the West is gas supply. Reserves are adequate on the basis of 1956 proven reserves and demand. But, all calculations point to an unusually spectacular growth that can be expected in the western states during the years through 1960, and thereafter. When these gas industry demand growth estimates are studied, it can be seen that satisfaction of the firm loads offers some challenge. The answer to this problem will be Canadian natural gas. It will start to flow across the border in important volume this year.



Gas plays important role in state's energy demands

THE state of California is big. It is second to giant Texas in area. It is second to teeming New York in population. It is big in agriculture and big in gross product. It is the major gas market in all the west.

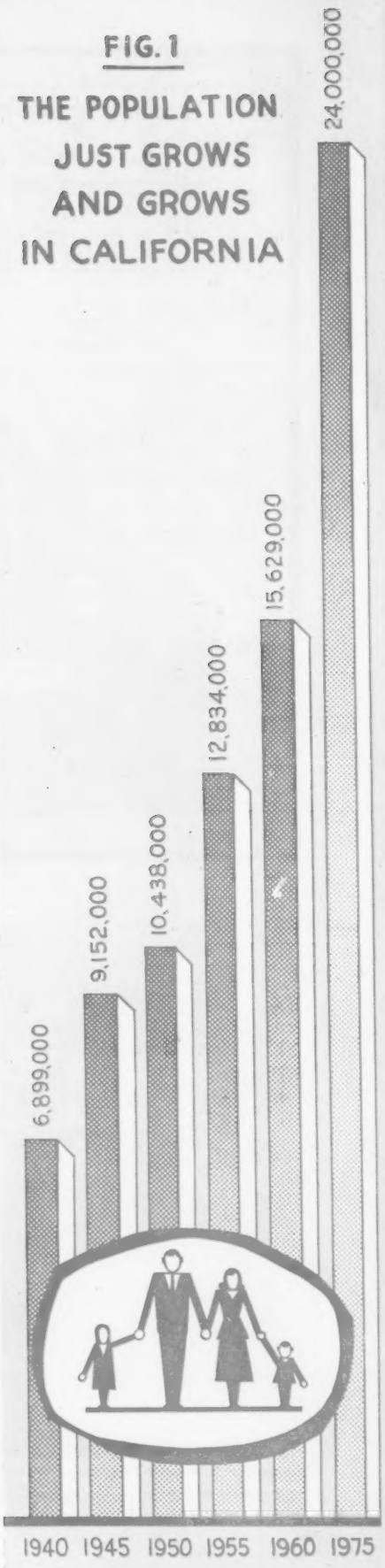
In addition to being big by most yardsticks, it is growing at a fantastic rate in nearly all departments. This is increasing its many problems. Not the least of these problems is the matter of energy supply for the state. For as a state grows in population and industry, the energy requirements leap upwards at geometrical rates.

Energy is needed in California for a variety of purposes—from house heating to rocket fuels. The

New distribution mains are being installed at rapid pace to keep up with population increase throughout California

FIG. 1

THE POPULATION JUST GROWS AND GROWS IN CALIFORNIA



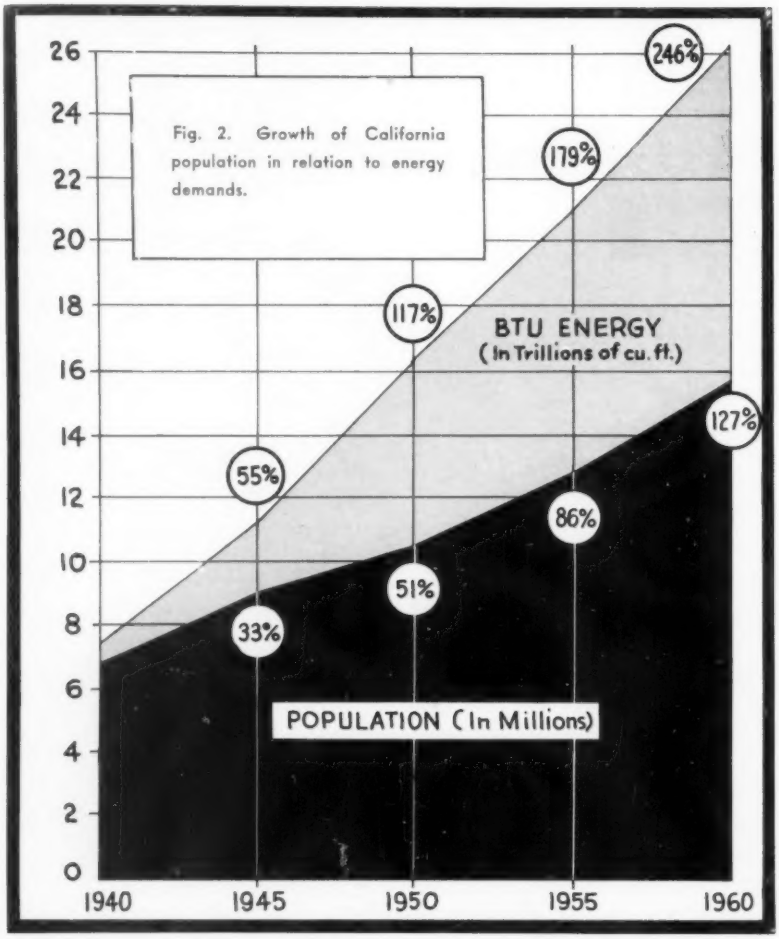


Fig. 2. Growth of California population in relation to energy demands.

Distribution companies have been continually expanding their systems in California since the end of World War II. The outlook is for more expansion in years to come.

state has many climatic and terresterial paradoxes. There are abject deserts and lush, semi-tropical areas. Northern California tends to be cold and damp, while southern California is mild and dry. Part of California is below sea level and there are cloud-scraping mountains nearby within the state. There is clean, clear air and there is the Los Angeles basin.

Fig. 1 shows the increase in population for growing California. Note the sharpness of the curve. The U. S. Census Bureau has estimated that California's population will top that of the state of New York during the year 1965—it will then be the most heavily populated state in the nation. People must have dwelling units and look to industry to provide the jobs that maintain their family units. The living and working of the large population expected in California, plus the recreational pursuits of this mass, will mean energy demands that are greater than anyone reasonably expected back in 1950. The job of supplying the energy requirements for domestic, commercial, and industrial applications will be staggering.

The curves on *Fig. 2* show the growth of population for California in relation to actual and estimates of energy demands through the years. The energy requirements exclude military needs, hydro-electric, and nuclear fuel data. The part natural gas will play in the provision of this energy demand is shown on *Fig. 3*.

In the over-all energy picture, the part that natural gas will play becomes of increasing importance as the state grows. This changing picture is shown on *Fig. 4*. It is interesting to note that the total energy will be used in 1975 much as it was in 1955:

43 per cent industry
37 per cent transportation
18 per cent residential and commercial
2 per cent military

Where will this fuel come from? Will it supply all existing demands? These and many other associated problems are faced by the distribution companies in California.

California is a gas-accustomed state. Prior to development of its oil fields there was manufactured

gas available in centers of population. Then, when the oil fields were brought in, natural gas produced in association became available for market. However, the increase in population—and resulting dwelling units — experienced during and after World War II, rendered all intrastate gas supplies inadequate. The only answer was to build a great natural gas transmission system to bring out-of-state gas into California to augment intrastate-produced gas. Thus, the great El Paso Natural Gas system to California was born. Paul Kayser and associates put together a pipeline, got the gas supply from K. S. Adams of Phillips Petroleum, and started the ball rolling with 150 MMcf/day delivered to the California border from residue gas being flared in the Permian basin and dry gas reserves in the Texas Panhandle. This was in 1947; since then, there has been a big problem at El Paso Natural. That has been to find and contract for natural gas reserves in the volumes necessary to cope with the ever increasing California demand. The pipeline facilities have been constantly increased to take this gas to the California market.

Currently, about 60 per cent of the natural gas requirements for California come from out-of-state fields. There have been oil fields in the state for many years and the associated or dissolved natural gas produced therewith has been available for years, but the greatest majority of the California-produced gas is oil well gas rather than dry gas. Therefore, as the oil production of the state has declined, so has there been a declination in oilwell gas availability. Too, the rate of production is based on the demand for crude oil rather than the demand for gas. This is not advantageous to gas utilities whose demands, in turn, are not apt to be in a happy relationship with the fluctuations of the crude oil market. It is reasonable to assume that the crude oil — and natural gas — production within California will continue to decline. New discoveries have been very few; in fact, since 1940, there have been only two important oil field discoveries and one major extension of a proven field.

The current and projected deliveries of out-of-state gas are shown on *Fig. 5*. From this illustration, the estimated market for natural gas in California during 1960 will be 1.1 trillion cu ft. The total out-of-state delivery for the same year (according to current plans and certificates) will be 697 billion cu ft—a deficit of 403 billion cu ft that must be made up from California-produced natural gas or from gas making (LPG-air, etc.). Probably 200 billion cu ft of oilwell gas will be available during 1960 and another 98 billion cu ft of natural gas will be produced from dry gas wells within the state. This leaves a deficit of 105 billion cu ft of gas for the year or 288 MMcf/day for the entire state. Unless further applications are made, serious curtailment and cut-backs of industrial gas, notably

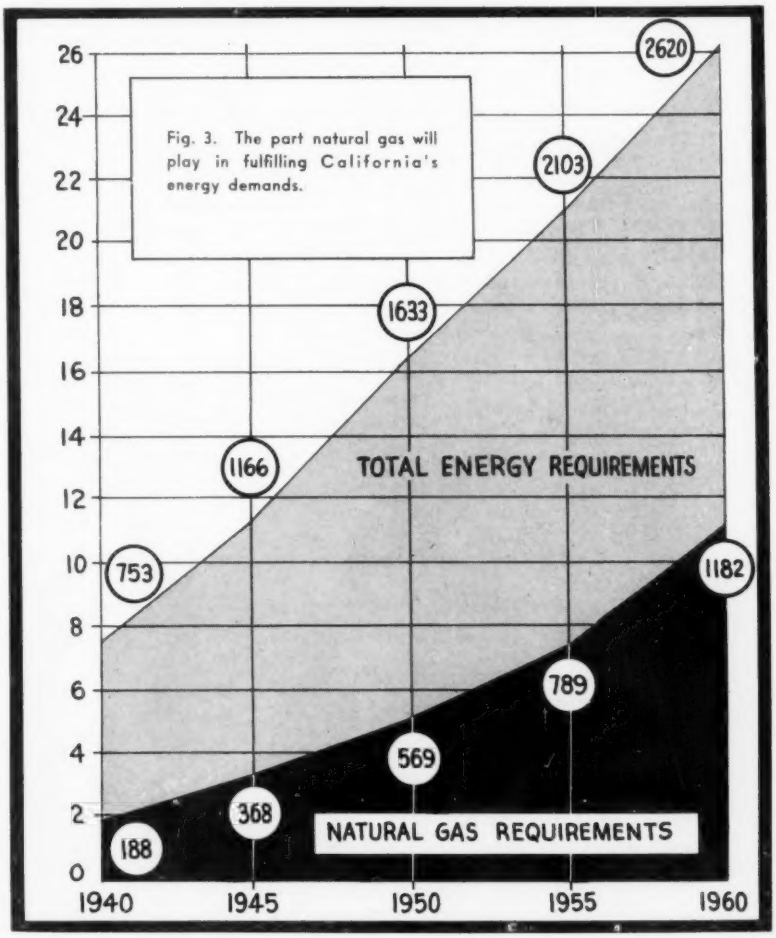


Fig. 3. The part natural gas will play in fulfilling California's energy demands.

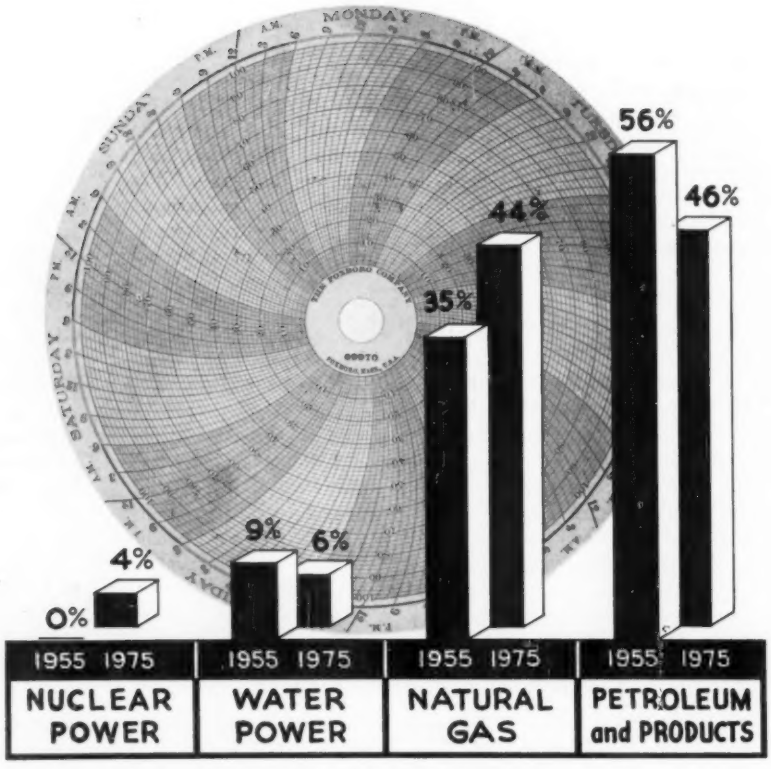


Fig. 4. The changing picture of fuel demand in California.

that for steam power-generating stations will be necessary.

Actually, it looks as if all available natural gas supplies for California will just about equal the domestic, commercial, and firm industrial demand for energy from natural gas during 1960. However, there will be a very important deficit of natural gas to fuel electricity generating facilities.

Steam electric plants will require 462 trillion Btu during 1960. Experts estimate that residual fuel oils can supply only about 38 per cent of this thermal energy requirement. The only other logical, economical source of energy to make up the remainder of the requirement is natural gas. But, natural gas is not available to supply this steam electric plant thermal demand under current plans and certificated capacities. Hydro-electric capacity in California has reached its economic limit; however, nuclear energy is expected to put in a token appearance in the state before 1960. The part nuclear energy will play will be experimental and the heavy dependence will be on steam electric plants through 1960.

Facilities required to handle a total sendout for the state of California of 1.1 trillion cu ft during 1960 are not presently in existence. To construct additional facilities required, California gas companies will spend more than $295 million between Jan. 1, 1957 and Dec. 31, 1960. Much of this will be for improved and expanded distribution facilities — mains, valves, meters, regulators. As an example, one major gas company plans to spend $100 million to be able to handle the 1960 sendout and about 45 per cent of this will be spent for facilities to take care of increased domestic consumers.

The appliance market in California will be second to none between now and the end of 1960. Predictions involving the consuming public are always dependent on continuance of "good business" years. From all reports, there is little reason to expect serious declines in the national economy during these years.

Fig. 5—The total natural gas requirements for California related to out-of-state supply.

(unit—MMcf)

Year	Total	Out-of-State
1955	883,720	512,989
1956	924,650	564,015
1957	960,000	645,383
1958	986,050	691,844
1959	995,350	694,307
1960	1,100,000	697,351

SINCE 1950, Arizona has led the nation in rate of growth for manufacturing employment, bank capital and farm income, and is second in population and income growth. In 1950, its population was 754,000; by 1960 an anticipated rise of 29 per cent will number population at 973,000; some estimators say it has already reached the million mark. The consensus seems to be that in 1975, Arizona will be populated by 2.5 million residents.

More than half of Arizona's residents live in Maricopa county. Phoenix is the county seat and also the state capital. Industrially speaking, what affects Phoenix affects the state and vice versa. Since 1950, people have been moving to Phoenix at the rate of 25,000 per year.

Once predominantly agricultural, Arizona now has a diversified and well-balanced economy. Mining, manufacturing and agriculture ended 1955 within $20 million of each other, incomewise.

The pace set in the 1945-1955 decade, when mining and manufacturing surpassed agriculture in Arizona's economy, has not been slackened and apparently won't be.

In the seven years preceding 1955, 160 new manufacturing plants located in the Phoenix area. Tucson is the second big industrial city.

The future? The program to attract desirable industries continues. Industrial land sites are continually being developed. The city fathers want to eliminate possibilities of smog. So-called "smoke-stack" industries are not as welcome as light industry — assembly plants, electronics, small manufacturing plants, and warehouses. However, Phoenix is not dismissing the thought of getting more heavy industry, properly controlled, as the copper mines and smelters have been a backbone of the economy and low grade iron ore and coal deposits located throughout the state may some day be developed.

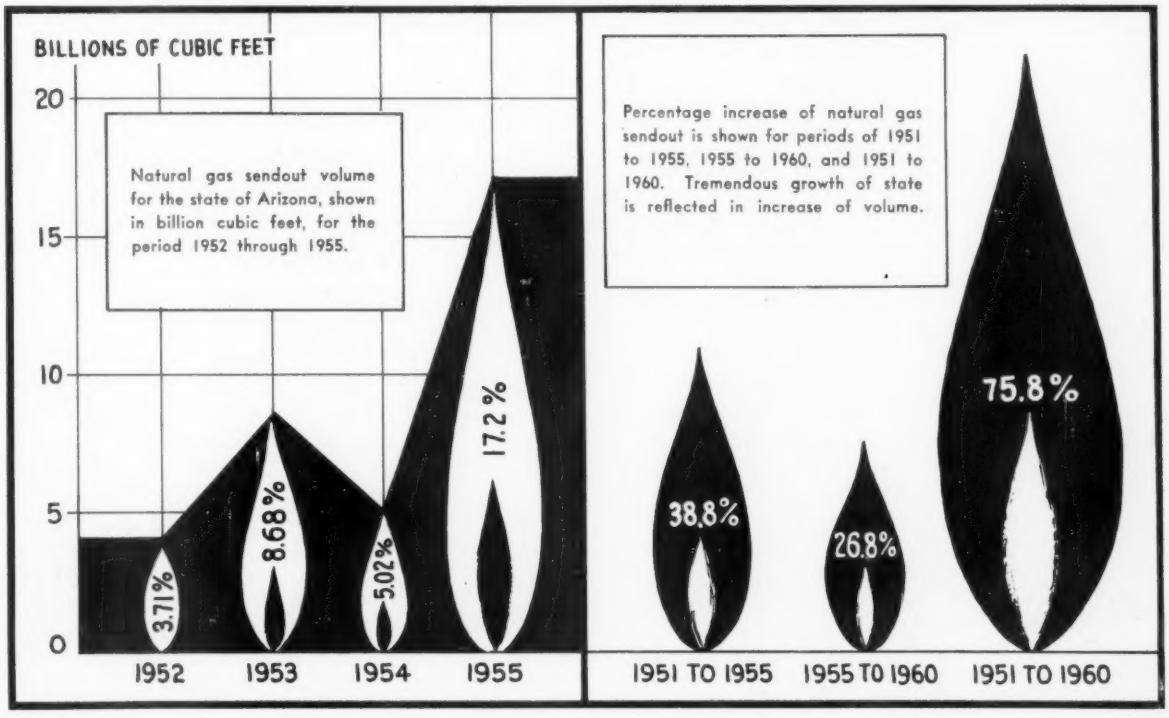
The next 20 years may see an Arizona population of 2½ to 3 million, based on two factors: immigration at an increasing rate and peaceful application of atomic power and developments in solar energy.

The gas industry throughout Arizona has enjoyed a tremendous period of growth in the postwar years. During the period 1951-1955, the statewide use of natural gas increased 38.6 per cent.

In 1951, 56.5 billion cu ft of gas was used by customers in all classifications: by 1960, distribution and transmission companies serving Arizona will be called upon to supply 99.5 billion cu ft to meet the demands of consumers.

Thirteen distribution companies serve 94 Arizona cities and towns with natural gas. All 13 distribution companies have one thing in common: they all are dependent upon the huge El Paso Natural Gas Co. system for their supplies.

Arizona industry is a big user of natural gas for energy. In 1955, only California and Colorado topped its total of 57.5 billion cu ft which went to industrial users. Heaviest users of gas are the steam generating plants of electric utilities. Mining and smelting plants also are big purchasers of gas.



COLORADO, a state of mountain peaks, rivers, rolling plains, deserts, giant canyons and geysers, is bisected by the Continental Divide of the Rocky Mountains. More than two thirds of its 1.5 million residents live in a 30-mile wide belt running from north to south on the eastern foothills of the Rockies. With the exception of Grand Junction in the southwestern part of the state, all of the larger cities are located along the Eastern slope. Its capital city of Denver is the principal metropolis of the entire Rocky Mountain region.

Primarily a stock-raising, farming and mining state, Colorado nevertheless ranks high in the manufacturing of mining machinery, railroad shop construction and repairs, rubber manufacturing, and manufacturing explosives. Pueblo, a city of more than 63,000, is one of the few cities in the West having an iron and steel industry.

Hot summers, cold winters, considerable sunshine and relatively low humidity mark the state's climate. Temperature has a high daily range, averaging 31° for January and 72°F for July. The state has 5686 degree days.

In apparent conflict with its mountainous terrain, dry climate, and short growing season, Colorado has an irrigated agricultural industry that ranks second only to California in land extent, with more than 3 million acres under irrigation. Its principal crops are sugar beets, alfalfa, vegetables, fruit, and grain. Some 26 million acres are grazing lands, including about 7.5 million acres federally owned.

Colorado is the leading U. S. producer of uranium, radium, molybdenum and vanadium, but the state produces bituminous coal and petroleum in the greatest volume. Also important are gold, silver, lead, zinc, tungsten, lithium, fluorspar, and feldspar. Extraction methods are under development in a pilot plant at Rifle for large western slope deposits of oil shale.

It is estimated that by 1960 Colorado will still rank fourth populationwise among the 11 western states, led by California, Washington, and Oregon. Its 1,335,000 residents in 1950 will have increased to 1,518,000 by 1960, a 13.7 per cent rise.

The gas utility business is, naturally, closely tied-in with the great center of population that runs along the eastern foothills of the Rockies. Denver, Colorado Springs, Boulder, Pueblo, Greeley, and others, have had gas service for years. With the construction of the Pacific Northwest Pipeline, cities in the southwest part of the state have been provided with natural gas service for the first time in 1956.

Back in 1950, the state of Colorado had gas energy requirements for about 55.2 billion cu ft for the year. In 1960, these energy requirements from natural gas will have increased to 163 billion cu ft—an increase of 195 per cent. This compares with a population growth of 13.7 per cent.

New industry and the construction of the Pacific Northwest pipeline are the keys to this huge increase in gas market. To cover them in the same order, new industry is fairly dotting the landscape of Colorado. Guided missiles, atomic energy, mining, and the influx of offices of oil companies have swelled the industrial potential of the state. Many new plants list the availability of natural gas at a relatively cheap price as one of the major reasons for their locating in Colorado. A major oil company is building a new research center within the state. Such projects along with defense projects, such as the new Air Force Academy near Colorado Springs, mean much small industry is being developed to service and supply the new industry and the people attracted to the state thereby. Just two plants, Vanadium Corporation of America near Nucla and Union Carbide Nuclear Co. near Uravan, will take 1.679 billion cu ft of natural gas—on an interruptible basis—in 1960.

The advent of Pacific Northwest Pipeline Corp.'s *Scenic Inch* pipeline has increased the gas supply to Colorado by extending natural gas service to small communities in the southwestern part of the state, such as Cortez, Dolores, Dove Creek, and Mancos. These cities will use a combined volume of 280 MMcf during 1960.

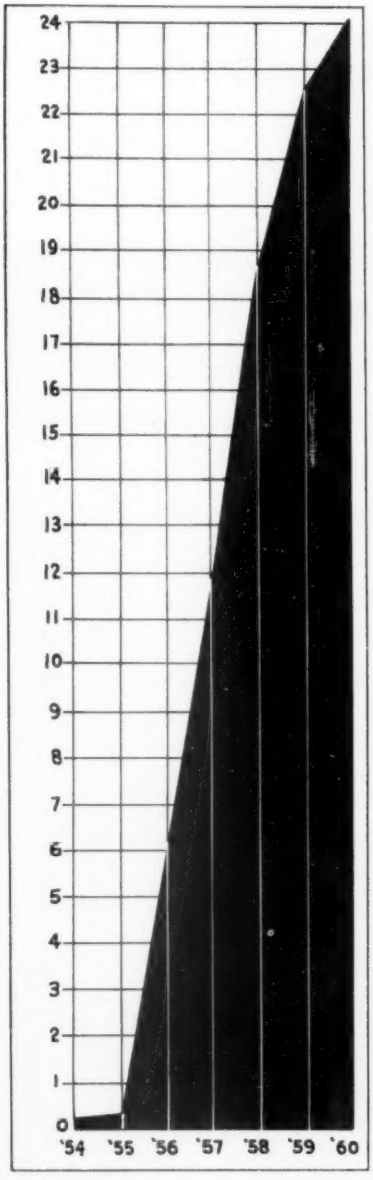
Colorado Interstate Gas Co. is tapping the *Scenic Inch* pipeline with its new transmission extension that runs from Rock Springs, Wyo., over to Cheyenne, Wyo., and down to Denver. This line will bring additional energy to the large Denver market. It will also serve in plans and applications Colorado Interstate has to send gas to the midwest.

To expand the facilities required to handle the anticipated volume of natural gas that will be sold within the state, it looks as if about $147 million will have to be invested by the distribution and transmission companies operating therein. About $30 million will be for distribution facilities alone.

Growth in natural gas sendout volume for the State of Colorado

(In billion cu ft)

1951	90.8	1956	130.2
1952	93.3	1957	138.8
1953	108.6	1958	144.2
1954	110.4	1959	153.1
1955	124.9	1960	163.0



Growth of total gas sales in Idaho, showing effect of Pacific Northwest pipeline. Sales shown in millions of cubic feet.

ALTHOUGH Idaho has been hampered industrially by the lack of economical fuel, its abundant stores of raw materials put it in a favorable position as a manufacturing site. Currently, its industry is based on agriculture: beet-suger refining, flour milling, vegetable and fruit canning, meat packing.

Second-ranking lumber industry produces an income of $150 million annually. In addition to construction lumber, Idaho processes a wide variety of paper products, poles, shingles, fuel concentrates, and allied products. Mining ranks third in the state's economy. An atomic energy processing plant is located at Arco in Butte county, west of Idaho Falls and near the colorfully named Craters of the Moon National Monument.

Idaho's 599,000 residents counted in the 1950 census will increase to 673,000 by 1960, a 12.4 per cent increase.

The state, which has been described as wholly mountainous, is cut in two by large, almost completely uninhabited, mountain masses, forming a barrier between northern and southern Idaho. Cold winters and dry summers characterize its climate. In Boise, where the January mean temperature is 30.4°F and July is 74.0°, there are 5890 degree-days, averaged out over a 30-year period. Lewiston has 5480 degree days and a 33.4°F temperature in January and 75.9° in July. Pocatello has 6976 degree days.

The gas industry is really in its pioneer year in Idaho in 1957. Only three cities had distribution systems to handle manufactured (propane-air) gas prior to 1957. These cities — Couer d'Alene, Lewiston and Moscow—are converting to natural gas, now available from Pacific Northwest Pipeline Corp.'s *Scenic Inch*. Complete distribution systems must be built in at least 10 other Idaho communities which are slated to receive natural gas in 1958. New systems have been built, or are now under construction, in 21 smaller cities receiving natural gas for the first time this year.

Industrial plants have jumped on the natural gas bandwagon in much faster fashion than have the distribution company customers, due chiefly to the lack of previous pipeline systems. Four industrial customers who buy direct from Pacific Northwest will use 9.9 billion cu ft in 1957: distribution companies expect to sell 1.721 billion cu ft on both firm and interruptible basis during the same period.

The picture will change in 1960. By then, distribution systems will be in. The 1960 sales by utilities in the state will reach 12.9 billion cu ft on firm and interruptible contracts. The four direct users expect to consume 11.6 billion in 1960. These four industrial plants are Food Machinery and Chemical Corp., Pocatello; Idaho Portland Cement Co., Inkom; Potlatch Forests Inc., Lewiston; and J. R. Simplot Co., Pocatello.

Although natural gas is still in its infancy in Idaho, franchise battles have been running hot and heavy through the state courts for three years. Idaho Natural originally was granted franchise rights for southern Idaho; then, the state supreme court reversed this grant with a decision permitting Intermountain Gas Co. to serve the area.

After several months of legal skirmishing, Idaho Natural announced it was dropping its appeal, and disappeared from the scene. Now, Intermountain holds franchises for gas service in 17 communities.

This does not necessarily mean that the way is now clear for Intermountain to begin serving all these communities. Another threat, in the form of co-operative movements, has sprung up in many of the cities which Intermountain plans to serve.

Intermountain's position has become much stronger in recent weeks following an Idaho supreme court ruling which held that the Idaho Falls cooperative was "illegal, void and of no effect." Intermountain officials are hopeful that this will set a precedent.

In any case, Intermountain has announced a $7 million expansion program to bring natural gas service to the cities which have now granted them franchises.

IT is expected that Montana will show the smallest gain in population of all the western states during the next 10 years. The figure of 602,000 residents from the 1950 census will probably grow to 637,000 by 1960, a 5.8 per cent increase.

Montana's economic mainstay is its soil and mineral deposits—agriculture accounted for 15 to 35 per cent of the total income payments during the past 20 years, with mining following closely. Zinc production ranks first in the U. S. Of primary importance are copper, zinc, silver, manganese, and lead.

Wheat and cattle account for two-thirds of the total farm income. Because of the harsh climate in the plains, la.ge scale dry farming is practiced and hardy crops predominate. Among them are corn, oats, barley, flaxseed, potatoes, beans, sugar beets, hay and sweet cherries. Chief livestock markets are Miles City, Billings, and Dillon. The state ranks high in wool production, clipping more than 1.5 million sheep in some years.

Industrially, the state depends primarily on its mineral resources. Ore is smelted and refined. Cement, bricks, metal castings, wire, arsenic, sulfuric acid, and phosphate fertilizer are produced in Butte, Anaconda, Great Falls, Helena, and Lewistown. Power for the metal industry is obtained from dams on the Missouri river. The Butte area is one of the richest mining districts in the world. Copper ore is shipped from Butte mines to Anaconda, where it is smelted and then sent to Great Falls electrolytic refinery.

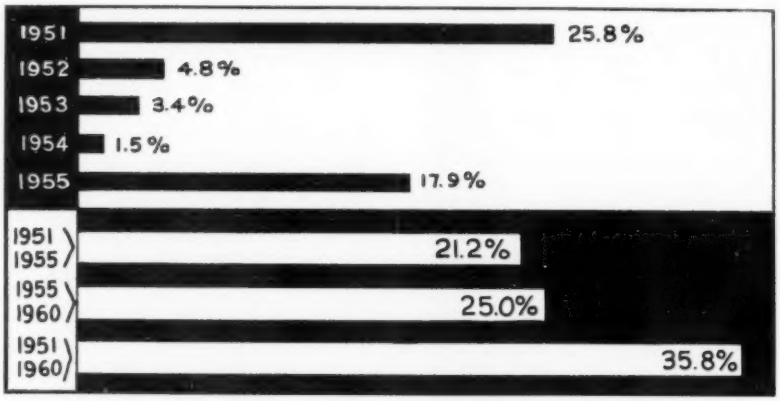
In the past 30 years, five of Montana's major cities have averaged 6891 degree days per year. In the great plains of eastern Montana, winters are severe with cold winds and snowstorms sweeping down from Canada. Relief is often brought, however, by warm chinook winds along the eastern slopes of the Rockies. Summers are hot and dry. In the sheltered mountain valleys of the west, winters are more moderate and summers are cooler.

Butte has a mean January temperature of 22.7°F and 64.8° in July; Great Falls drops to 23.6° in January from 69.0° in July; and in Billings, the January mean temperature is 23.2° and 71.2° in July.

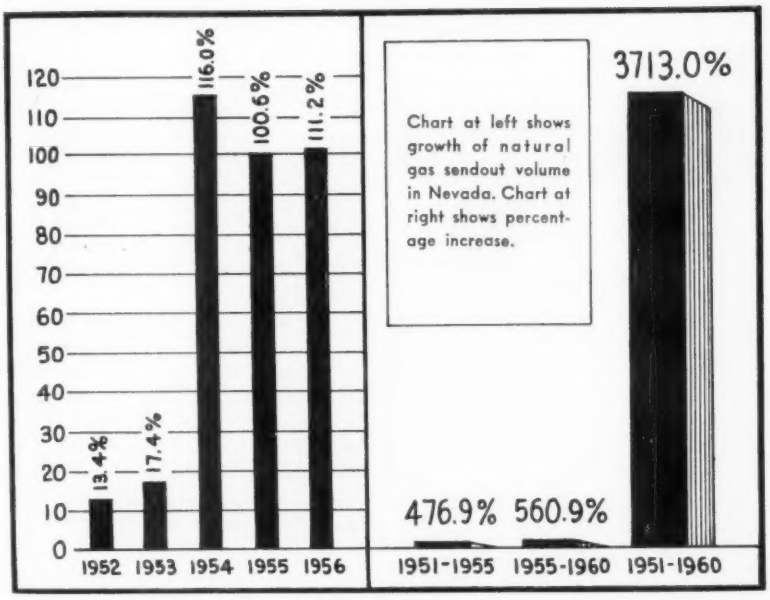
The gas requirements trend in Montana will generally follow the population growth, as industry has not shown any inclination to exceed growth that would normally be expected for the state. The growth in demand for gas energy will be steady, though not spectacular.

Montana produced 30.7 billion cu ft during 1954 and marketed 30.3 billion of this production. It does not seem logical to expect the Montana production of natural gas to supply much more than this portion of the volume needed during 1960—54.4 billion cu ft. The production statistics for the state reveal that 153 wildcat wells were drilled therein during 1955 with only 13—or 8.5 per cent—being productive.

The Montana Power Co. is, at the current time, the sole importer of Canadian gas in the United States. They currently account for a trickle of natural gas from Alberta, Canada, that moves across the international boundary.



Percentage increase in total natural gas sales for Montana.



As far as population is concerned, Nevada ranks at the bottom of the list of the 11 western states. But, if you're judging the state on reputation, Nevada is big.

No other area with a little population has been, or probably ever will be, as well-known throughout the world.

Nevada is famous the world over for two basic "industries"—gambling casinos and "quickie" divorce courts. Long before the eyes of the world were centered on Yucca Flats for the atomic bomb tests, nearby Las Vegas had become as well-known as such American cities as Los Angeles, San Francisco, or Chicago. Reno, which gained its fame more for divorces than for gambling, also is internationally known, although it has taken a back seat in recent years to its more flamboyant neighbor to the south.

Nevada ranked 11th among the 11 western states in population in 1950. It should retain this basement rating again in 1960, if forecasters' glances into the future are correct. But, in rate of growth during the 1950-1960 period, Nevada will run a close third behind leader California and runner-up Arizona. A 27.8 per cent population increase is expected by 1960, with a total of more than 202,000 inhabitants.

The lavish gambling casinos and tourist hotels of Las Vegas and Reno annually produce the biggest income for Nevada. During 1955, nearly 8 million tourists left more than $100 million behind them. The biggest chunk of this was deposited on the rolling green carpets of crap tables, or beside whirling roulette wheels.

Industrial growth in southern Nevada has been steady since World War II. The city of Henderson was nothing more than barren desert land before the war started. Now, it is the third largest city in the state. Private industry has moved into an area adjacent to the city formerly occupied by the federal government's Basic Magnesium project. Located there are Western Electro-chemical Co., U. S. Lime Products, Titanium Metals Corp., Stauffer Chemical Co. and Manganese Inc.

Mining plays a vital role in Nevada economy. It has produced more than $40 million annually since 1859. The open-cut copper pit near Ruth is the largest mine of its kind in the world, a mile wide and 650 ft deep. Fluorspar, iron ore, magnesite, brucite and tungsten are mined in quantity.

Nevada's residents have lots of buying power—the per capita income is always among the highest in the nation. Nevada retail sales increased 65 per cent from 1948 to 1954, compared with a national increase of 31 per cent.

Nevada's dry continental climate is topped in the southern part of the state by Las Vegas, which has a mean temperature of 86.1°F in July, and drops to 44.6° in January. Carson City, close to the California border near Lake Tahoe, has a high of 68.6° and a 32.4° low. Over a 30-year period, the degree days of Reno, Tonopah, and Winnemucca average 6073.

The demand for natural gas energy in southern Nevada is on the upswing. During 1954, distribution companies converted from LPG-air to natural gas. Last year the combined sendout of the utilities serving southern Nevada was 2.5 billion cu ft. This will rise 27 per cent by 1960, with the sendout reaching 3.5 billion cu ft.

Right now, it is impossible to visualize the state-wide picture of the Nevada gas industry in 1960. The southern portion of the state has natural gas, the northern does not. Reno is served by a propane-air plant; other northern communities must depend upon butane and propane.

It seems almost a cinch that Reno and probably Carson City will have natural gas by 1960—probably sooner. Just how it will be piped in, and by whom, is anyone's guess. Rumors are plentiful: one report says a pipeline running from Las Vegas to Reno is on the drawing boards, and soon will become a reality; another says that a line will be built from the Pacific Northwest Pipeline, probably in the vicinity of Mountain Home, Idaho, and will run to Reno, and continue on to the California-Nevada border. Still another possibility is a line from Portland, Ore., south to San Francisco (carrying Canadian gas from Westcoast Transmission), with a line running east to Reno.

"Gas in the West"

THE world-wide struggle for continuing supremacy in the field of nuclear weapons probably has had more effect on New Mexico than on any other state in the nation.

Development of atomic bomb testing facilities at White Sands during World War II has brought about a form of industrial revolution in New Mexico. Nuclear development and testing facilities are now in operation at Los Alamos, Las Cruces and Albuquerque (cite of the Sandia Corp.'s facilities). The Air Force, too, is heavily involved, with such testing grounds as Holloman AFB at Alamagordo, and several other bases throughout the state.

These government and private research-and-testing projects have attracted many private technical manufacturers, mainly in the field of electronics, to the state. Most of the research centers are in remote sections of the vast New Mexico desert. These electronic suppliers, and other government sub-contractors, have realized they must be close to the scene of actual testing; hence, a new industrial future has opened up in New Mexico, based, conversely, on remoteness rather than easy accessibility.

The leading industry in New Mexico is gas and oil. The state's rich San Juan basin provides natural gas for most of the western states.

By 1960, the population of New Mexico is expected to top the 825,000 mark—a jump of nearly 21 per cent over the 1950 count of 700,000.

Eleven distribution companies serve 55 New Mexico cities and towns with natural gas. Like its southern neighbors, New Mexico is a state that is accustomed to natural gas, and has been for a long time. Its use of natural gas rose 59.1 per cent in 1955 over 1951.

This same trend will continue through 1960: by that time New Mexico will require 90.6 billion cu ft of natural gas to supply its needs. The year 1955 required 73.5 billion cu ft.

Industrial users have been taking slightly more than half of the state's gas supplies. This trend should continue through 1960, as plants expand and population grows.

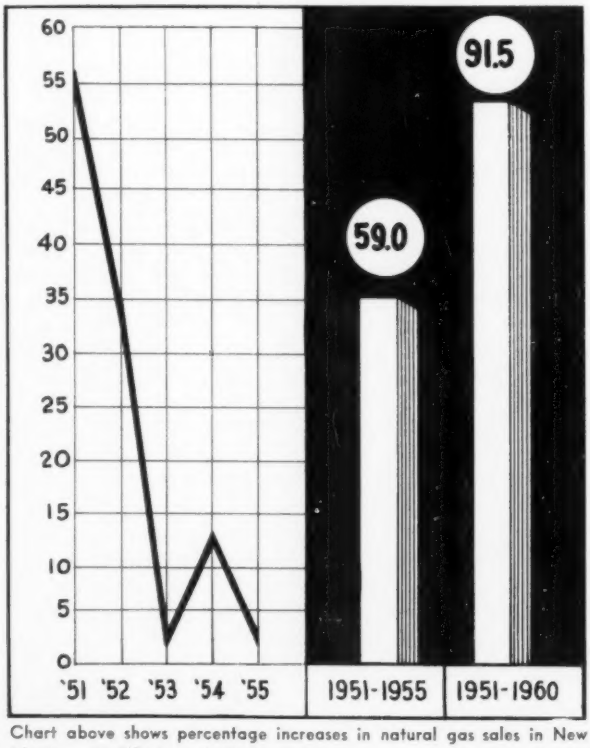


Chart above shows percentage increases in natural gas sales in New Mexico. At left is a typical construction scene in an area that is expanding its gas distribution systems.

THE Cascade mountain range bisects Oregon from east to west to divide the state climatically and industrially. The mountains lie about 100 miles inland from the coast and in the Wilamette valley, to the west, are most of the industrial centers of the state: Portland, Salem, Eugene, Oregon City, Corvallis. This division affects the economy and helps account for the wide diversification of agriculture and industry found in the state.

Processing of agricultural and forest resources has been Oregon's principal industry. Nearly one fourth of the nation's standing timber is in Oregon, and one third of its inhabitants are supported by lumber and its allied industries. The surface has barely been scratched in the utilization of wood waste. In the food industry, which is second in employment to timber, rapid expansion in canning, preserving, and quick freezing is anticipated.

Augmenting these mainstays of Oregon's economy is the prospect of new and expanded industries: shipbuilding, electrochemical and metallurgical works, aluminum fabrication, machinery and tool manufacturing, textiles, chemicals, ceramics, glass.

Three aluminum reduction plants operate in Portland along with fabricating facilities. Owens-Illinois Glass Co. built a multi-million dollar glass container plant in Portland last year.

In the Pacific Northwest area in general, a breakdown of 1950 employment shows 13.9 per cent of the labor force in extractive industries, 28.1 per cent in manufacturing and construction, and 28.6 per cent in miscellaneous other industrial. Regional population increased 52 per cent from 1930 to 1950, when it was about 5 million. In 1960 it will be 5.8 million. In Oregon itself the 1950 population was 1,536,000 with a 29 per cent increase to 1,918,000 expected by 1960.

Between 1939 and 1951 the total added by manufacturing in the Pacific Northwest, expressed in constant dollars, increased from $785 million to $2,101 million, or 168 per cent. The comparable U. S. increase was 109 per cent. Of the three Pacific Northwest states, Oregon showed the fastest rate of industrial growth with 200 per cent, followed by Washington with 152 per cent, and Idaho with 146.

The topography of Oregon varies from the moist coast-mountain-valley region in the west to the dry upland plateau in the east. Portland, in the west has a mean January temperature of 39.4°F while in July it's 66.7°. Its degree days number 4632 annually. Baker in the eastern part of the state goes to a high of 7087 degree days.

Oregon is starting its first full year on natural gas with four distribution companies serving 11 cities and towns.

This year, the distribution companies serving the state expect to deliver 19 billion cu ft through their systems; 7.1 billion cu ft on firm basis, and 11.9 billion on seasonal or interruptible schedules.

An indication of the expected popularity of natural gas in Oregon can be seen in the anticipated overall send-out of the companies for 1960: 30.7 billion cu ft, with 14.1 billion firm, and 16.6 seasonal or interruptible.

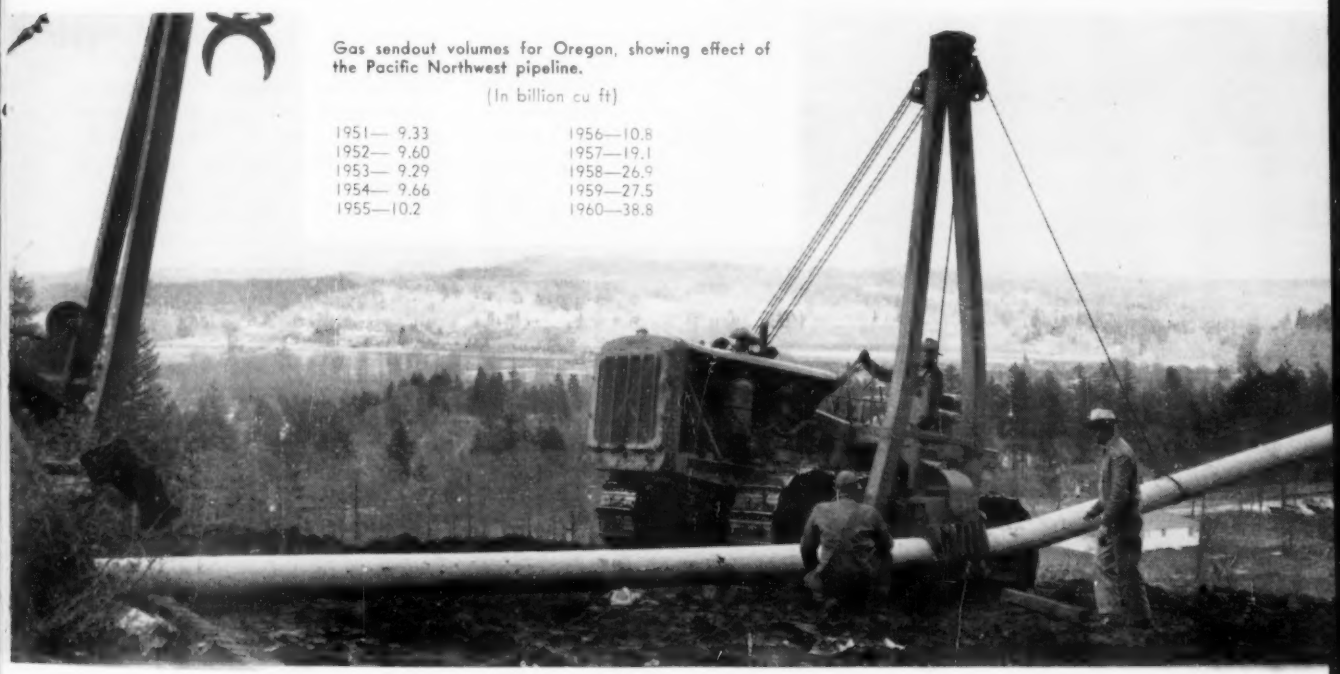
Distribution companies in the state have been expanding their systems, originally built to handle comparatively small loads of manufactured gas, at a rapid rate for more than a year. Some of this expansion has been completed—a great deal more of it remains to be done between now and 1960.

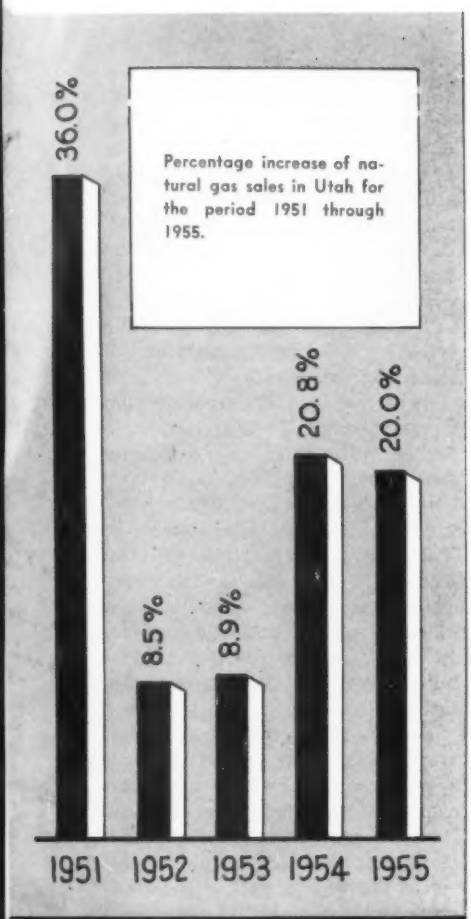
The largest distribution company in the state has appropriated $24 million for construction of new distribution facilities in the period 1957 through 1960. Other companies have made provisions for expansion in similar proportions.

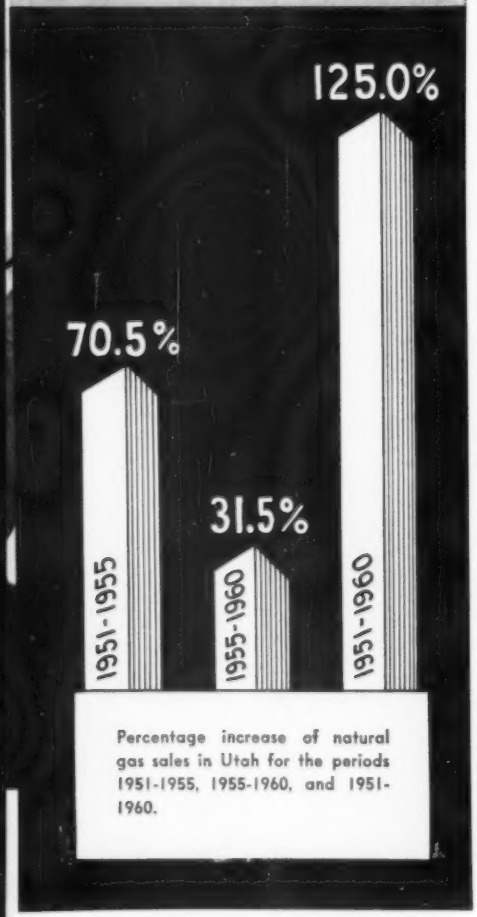
Gas sendout volumes for Oregon, showing effect of the Pacific Northwest pipeline.

(In billion cu ft)

1951— 9.33	1956—10.8
1952— 9.60	1957—19.1
1953— 9.29	1958—26.9
1954— 9.66	1959—27.5
1955—10.2	1960—38.8







STANDING on the well-preserved terraces left by the receding waters of prehistoric Lake Bonneville along the west base of the Wasatch mountain range in Utah are the important cities of Ogden, Salt Lake City, and Provo—industrial centers of the state.

Utah's main source of income is its mineral wealth—smelting and refining of metals is the largest single industry in the state. Some of the 26-in. pipe in the *Scenic Inch* was produced at U. S. Steel's Consolidated Western pipe mill, adjacent to the Columbia - Geneva Steel division plant in Geneva where the steel and plate are produced. The first carload of pipe was produced at the Utah pipe mill in April 1955.

Largest industry in Salt Lake City is oil refining. There also are oil refineries at Logan, iron foundries at Provo and Salt Lake, and food processing plants — sugar, flour, canned food — at Logan, Smithfield, Brigham City, Ogden, Provo, Spanish Fork, and Cedar City. Other industries include the manufacture of chemical explosives, clay and stone products, fertilizer, cement, lime, wool textiles, clothing, jewelry and cosmetics.

The state, with an average altitude of about 6000 ft, has a very dry continental climate of the steppe and desert variety. Salt Lake City has a mean temperature of 26°F in January and 77° in July. Average 30-year degree day count is 5463.

Like all other western states, Utah is expanding. Its 1950 population of 697,000 will probably grow to 823,000 in 1960 for an 18.1 per cent increase. Some estimators say there will be more than 1 million residents in the state by 1960.

Utah's most outstanding claim to fame in the gas industry is that its capital city, Salt Lake City, is currently headquarters for the Pacific Northwest Pipeline Corp., owners and operators of the *Scenic Inch*. In addition, Utah produces natural gas and markets some 30 billion cu ft of it.

With the completion of the *Scenic Inch* through the state, communities like Moab, Monticello, and Vernal were provided with natural gas service. These communities will use a combined volume of 372 MMcf during 1960 on a firm basis, and another 312 MMcf on an interruptible-seasonal basis. Total requirements for the state in 1960 will be 68.68 billion cu ft. This is an increase of 31.5 per cent over 1955, and 125 per cent over 1951.

Utah shows a nice growth in predicted gas-fired appliance sales. This will be due to new home construction as people move into the state and as a traditionally agricultural population follows the trend to migrate to cities where new industry is developing. Also, the fact that former farm workers are flocking to industrial jobs in the state will mean that individual family incomes will be increased—as they are now up over previous years—and the demand for more, modern appliances will be felt.

THE Evergreen State of Washington, with about 55 per cent of its area forested, is second only to Oregon as the nation's leading lumber-producing state. Like Oregon, about one third of Washington's people depend on the forests for their support.

The $318 million payroll of the forest industries represents more than 40 per cent of the state's manufacturing payroll. Almost 50 per cent of all plywood produced in the U. S. comes from Washington, which is also the leading producer of pulp. Hundreds of secondary industries operating in the state depend on timber for their supplies.

Although agriculture, lumbering, fishing, and their byproducts are the chief industries of Washington, the state also has diversified manufacturing. Chemicals, tin cans, malt liquors, iron and steel products, machinery, and light consumer goods are produced. Aluminum plants are located at Longview, Spokane, and Vancouver; one of the nation's largest aircraft companies, Boeing, operates out of Seattle; smelters operate in Tacoma and railroad shops operate in Spokane, Seattle, Tacoma, Everett, and Pasco.

The abundance of water, construction of power dams and cheap electricity, as well as World War II military requirements, considerably expanded Washington's industrial output. An atomic energy project was established near Richland early in the war and the post-war project at the Hanford Atomic Works Project is one of the leading producers of plutonium.

Of major importance to the economic life of Washington is the Columbia river, which flows south and west across the state to the Pacific ocean. The Puget Sound lowland is the state's principal industrial and trading areas with a chain of seaport cities — Seattle, Tacoma, Bellingham, Everett, and Olympia. Spokane, in the eastern part of the state, is the commercial center of Washington's "Inland Empire."

Washington, the second largest state in the west, had a population count of 2,348,000 in 1950. It is expected to rise 20.9 per cent by 1960 for a total of 2,838,000. Estimates for 1965 are for more than 3 million.

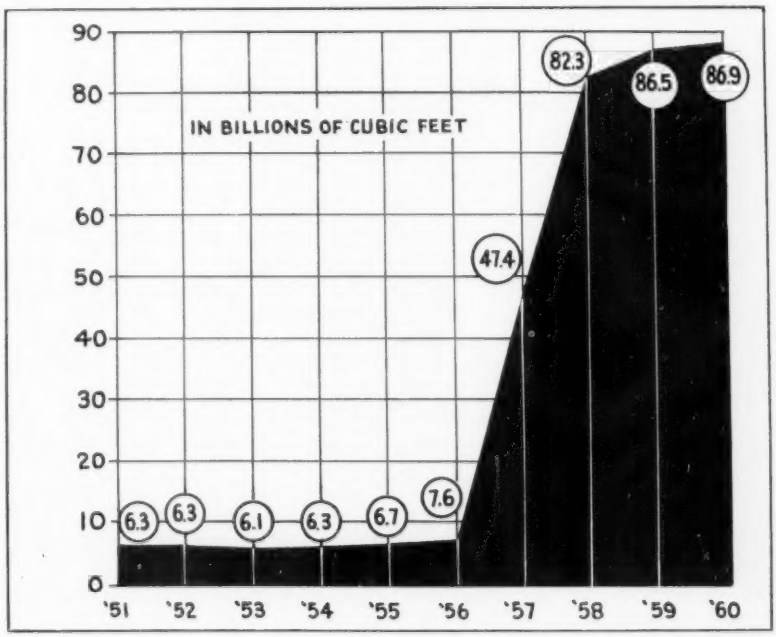
The climate of eastern Washington is mainly the dry continental type, with hot summers and cold winters. In Spokane, with 6852 degree days, the mean temperature in January is 28°F while the July mean is 69°. The Puget Sound lowland enjoys a temperate marine climate modified by warm ocean currents, with cool summers and warm winters. In Seattle, with 4438 degree days, the mean temperature in January is 40°F and in July it is 64°.

Like its southern neighbor, Oregon, Washington is entering its first year with natural gas available. The eight distribution companies serving 34 cities and towns are finding they have plenty of customers.

The predominance of interruptible gas over firm gas that will be used this year gives a good indication of how Washington industry is changing its fuel requirements. This year 31.4 billion cu ft of natural gas will be delivered in the state on seasonal or interruptible basis. Firm contracts call for delivery of 12.3 billion cu ft, giving the state a total of 43.7 billion. In addition, five direct customers will receive 3.7 billion cu ft from Pacific Northwest Pipeline Corp., supplier of gas to all distribution companies operating in Washington.

By 1960, the amount of gas delivered on firm and interruptible basis in Washington will climb to an expected 79.2 billion cu ft, 33.9 billion firm and 45.3 billion interruptible. The five direct pipeline customers will use 7.7 billion cu ft in 1960.

Expansion of facilities will be the keyword among distribution companies in the state. One company has announced a construction program totaling $21 million for the next four years. Others indicate they will follow suit.



Gas sendout volume for the state of Washington, showing the effect of the Pacific Northwest pipeline.

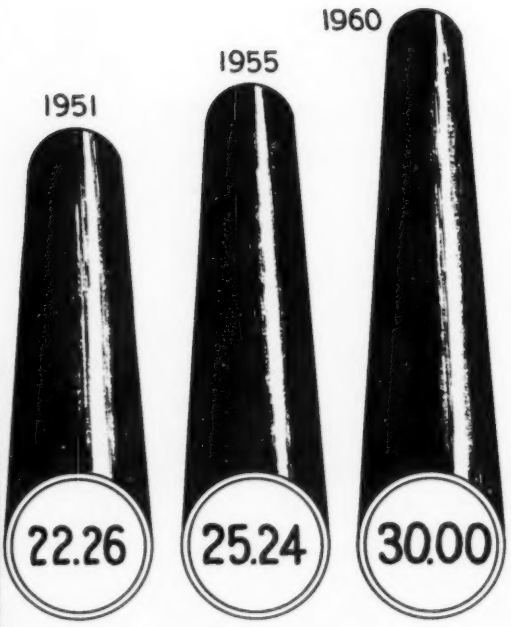


Chart shows the increasing sendout of natural gas in Wyoming, expressed in billion cubic feet, for 1951 and 1955, compared with the expected sendout in 1960.

WYOMING'S 287,000 citizens depend primarily upon cattle raising and mining for their livelihood. It is a leading livestock region that ranks next to Texas in wool and mutton production.

Much of the state is underlaid with good quality bituminous coal, said by some to be the greatest reserves in the country, but so far undeveloped. The state's leading mineral resource, however, is petroleum. Oil refineries are located at Casper, one of the important oil centers in the Rocky Mountain area, and at several other Wyoming cities.

Wyoming's manufacturing industries are on a small scale. Tents, bricks, and torpedoes are produced in Casper; Cheyenne has airplane and railway workshops; Laramie, cement; Sheridan and Rawlins, pistols and soda products. Railroad ties are made at Evanston from the local fir, pine, and spruce forests in the mountains.

The state is made up of a vast upland, averaging 5000 to 7000 ft in altitude. It is crossed by mountain ranges with intervening river basins and rolling plains. The most dry continental climate is marked by severe winters and fairly cool summers with an average annual rainfall of 15 in. and a winter snowfall of approximately 55 in. The capital city of Cheyenne has a January mean temperature of 27.6°F. In July it is 67°. Cheyenne's degree days number 7562.

Populationwise, Wyoming ranks as the 47th state in size, with its 287,000 residents. However, a 13.7 per cent increase is expected by 1960 which will raise the population to 322,000.

Twelve distribution companies serve 43 cities and towns throughout the state of Wyoming. Natural gas is, and has been for years, one of the state's principal fuel sources.

Wyoming's statewide pattern of gas usage has run a strange pattern in recent years. In 1950, the sendout was 20.2 billion cu ft; in 1951 it rose to 22.2 billion, and climbed again in 1952 to 22.6 billion. Then, it nosedived to 20.2 billion in 1953 and sunk to 21.8 billion in 1954. The year 1955 saw the figure move upward again, with 25 billion cu ft being used.

By 1960, this figure will be moving ahead steadily. It looks like 30 billion cu ft of gas will be required to meet the demands of that year—an expected increase of 20 per cent over 1955's sales.

Distribution systems will be expanded to meet the rising demand for gas in the state. One utility reports that it will spend more than $800,000 between 1957 and 1960 on expansion of its distribution facilities.

A REPORT ON TRANSMISSION OPERATIONS IN THE WEST BEGINS ON PAGE 89.

American Meter's new plant in Fullerton, Calif., will be the company's new west coast headquarters.

American Meter opens new plant to serve Pacific Coast markets

By J. FRED EBDON, Editor

Motoring along the wide freeway that spews traffic from Los Angeles to its nearby cities to the east, one is struck by the look of newness of the industrial establishments that are passed. Fine architecture, pleasing plantings, adequate parking, and cleanliness characterize industry here and generally along the west coast.

These thoughts were gathered while on the way to look over the newest addition to this modern industrial-plant trend that is dominating west coast industry—the new Fullerton (Calif.) plant of the American Meter Co. Here, in a low, sprawling type of building are housed production lines that are producing gas meters and other products for the western states. This plant, when coordinated with the production of a companion plant recently opened in Garland, Texas, will make or assemble the complete line of measurement and control equipment for which American Meter is so well known throughout the gas business, the oil patch, and the chemical industry. In addition, the Fullerton plant will serve as west coast headquarters for American.

W. G. Hamilton Jr., president of American Meter, explained that, "The Fullerton plant will place emphasis on production of the company's recently developed W-175 welded-steelcase meter . . . specially designed for West Coast usage for minimum DDD applications." Currently, it is planned to produce 600 W-175's a day. This meter has a welded design that was pioneered by American.

We noticed the extremely efficient use of light in the production area of the plant. Illumination engineers liberally used fixtures and the artificial lighting, coupled with glass-dominated walls to let in natural light, make the production area a pleasing (and efficient) place for meter craftsmen to work. Also, the safety features and general layout of the production lines add much to the plant's desireable work space.

George W. Stevenson, west coast manager for American, will headquarter at the Fullerton plant. He told us about the completely conveyorized production line that picks up raw materials at one end and delivers meters to the controlled-atmosphere proving room at the other. There are about 200 people on the assembly line now. After planned expansion, about 400 will be employed.

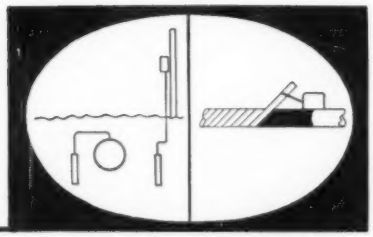
The plant has 60,000 sq ft of work space under its roof and was constructed with concrete tilt-up panels. A unique straight-through, electrostatic meter-painting facility has been designed and installed.

During the Dec. 7 opening day events, hundreds of gas industry guests toured the in-operation production lines and enjoyed the hospitality of a buffet on the grass under a striped circus tent. ■

George W. Stevenson (left) heads the new Fullerton plant for American Meter. In addition, he is manager of west coast operations for the company that was founded in 1836 to build meters and is still building them, plus associated products.

Corrosion Prevention

DISTRIBUTION • TRANSMISSION



By GUY CORFIELD

Surface preparation for painting

It is generally conceded that a relatively thin and unreinforced coating, such as a paint, is only as good as the cleanliness of the surface to which it is applied. An interesting discussion on metal surface cleaning is presented in Red Lead Technical Letter No. 11 put out by the Lead Industries Association, 60 East 42nd St., New York 17, entitled "Recommended Surface Preparation of Steel for Red Lead Paints." While developed especially for red leads, the recommendations would seem to have general application.

It is stated that mill scale, rust, dirt, grit, oil, grease, chemicals, and other surface contaminants make good paint performance impossible by preventing "wetting" of the metal. Rust, when it is painted over, continues to form and eventually destroys the adhesion of the paint film. Likewise mill scale is likely to be undermined by rust. These contaminants are briefly discussed. Welds and the adjacent area, not always recognized as trouble spots, are treated at some length. It is brought out that the welded area itself carries flux slag, fumes and oxides, and that there is usually an area as far as 8 in. from the weld which is also contaminated; furthermore, when paint is applied over weld metal spatter, the thin film over the raised spots will fail prematurely and encourage more general deterioration, and therefore such spatter should be blasted or ground off.

The point is made that when selecting a method of surface preparation consideration should be given to the condition of the surface to be painted, the type of service to which the metal and the paint will be subjected, the practicality of using a particular method because of environment, and the type of paint which is to be applied. Surface preparation methods are then discussed in detail, including mechanical means such as hand cleaning, power tool cleaning, sand or shot blasting, and flame cleaning; chemical means such as weathering, alkali cleaning, pickling, steam cleaning, and phosphate surface treatment; and solvent cleaning or degreasing. It is stressed that a prime coat should follow quickly after the cleaning is done, at least before any rusting can be seen. Numerous references are made to methods in the Steel Structures Painting Manual published by Steel Structures Painting Council (SSPC), 4400 Fifth Ave., Pittsburgh 13, Pa. It is apparent that considerable study has been given to what is often a somewhat neglected phase of corrosion prevention.

Corrosion Instruments

Two instruments have recently appeared which should be of interest to the corrosion engineer.

One is a gauge which will measure non-destructively the thickness of any non-magnetic film backed up by steel, and therefore is useful for measuring the thickness of paint or bituminous coatings on pipe. It is called the Elcometer dry film thickness gauge and sold by Gardner Laboratory Inc., P.O. Box 5728, Bethesda 14, Md. About the size of a man's hand, it requires no outside power source and can therefore be used in the field as easily as in the pipe yard.

To take a thickness reading, the two spherical tips at the bottom of the gauge are placed on the coating, with the instrument at right angles to the surface. The pointer-locking button is then depressed and the pointer moves on the scale to register the thickness of the coating, and locks in place when the button is released. Readings are direct in mils or fractions of an inch, scale ranges being 0 to 2, 3, 5, 10 and 20 mils, 15 to 40 mils, 40 to 80 mils, and 0 to ⅛, ¼, ⅜ and ¾ in. Calibration can be checked by measuring the known thickness of any non-magnetic material placed on or against an iron or steel base of the same type, thickness and contour as that on which the coating to be tested has been applied; an adjusting knob is then used to set the pointer to the correct reading; brass shims of various thicknesses are supplied for this purpose.

The instrument with leather case, plus calibrating shims, costs $68 f.o.b. Bethesda. A complete

(*Continued on page* 60)

Announcing

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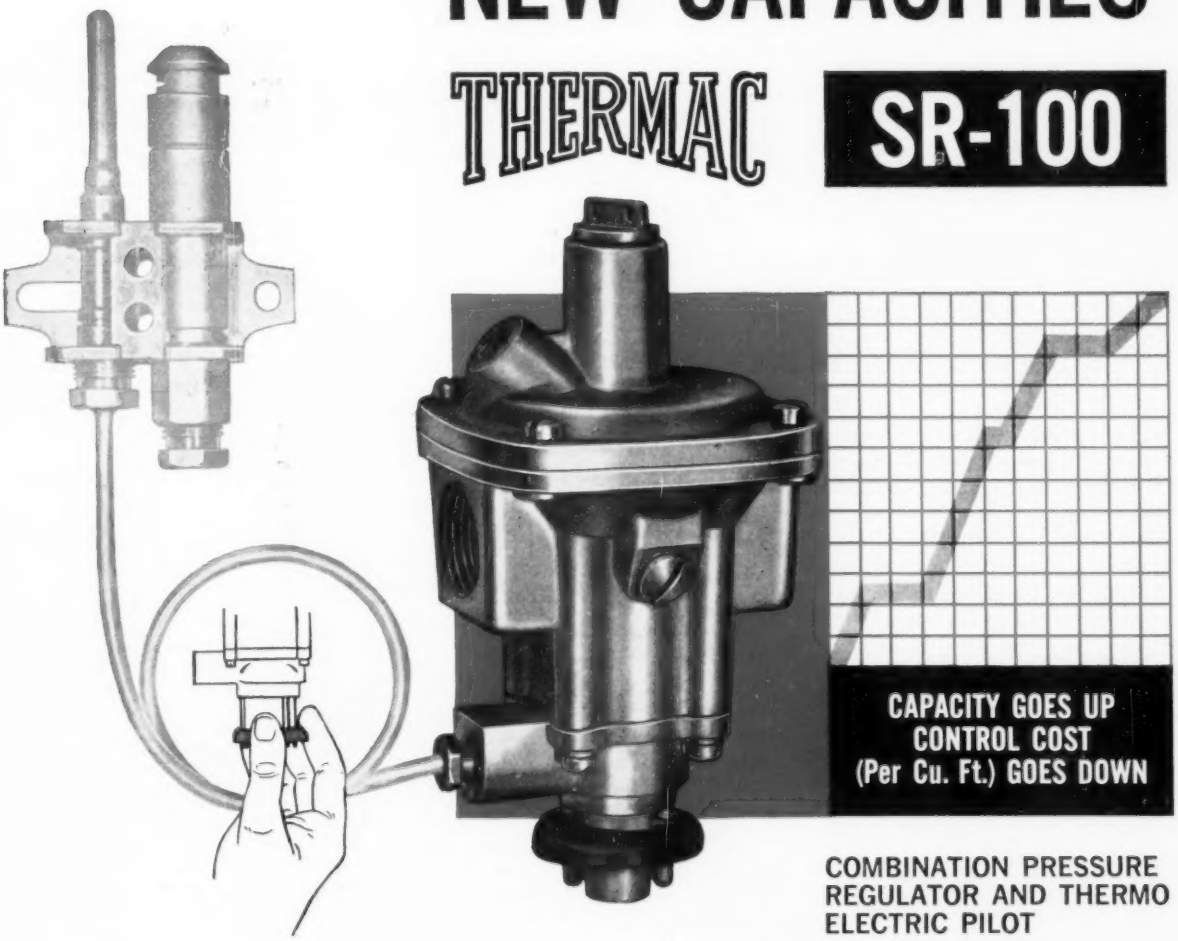

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Responsibility of leadership in the controls business demands constant research and progress for improvement in product performance and lower cost. This, we have achieved and proudly offer to appliance engineers.

Our engineers have built into the Thermac SR-100 a new ability to handle a broader range of furnaces and appliances. So marked is this increased capacity that now the SR-100 can be used where here-to-fore a more expensive control has been required. This increased capacity is not a mere "technical" increase of 5% or 10% but a great deal more, as will be observed when testing the new unit.

Carrying A.G.A. Certification and patent application, the unique method which we employ to increase flow capacities is now a part of all SR-100 controls at no extra cost.

You are invited to request samples of this new SR-100 for testing and comparison.

(*Continued from page* 58)

description can be obtained by writing for Gardner Lab.'s Bulletin No. 136.

The other instrument is less definite in its use and description, but appears to have interesting possibilities. It is called the Labline-Pure corrosion tester, developed by Pure Oil Co. and manufactured and distributed by Labline Inc., 3070-82 W. Grand Ave., Chicago 22, Ill.

It is described as a new instrument to rapidly measure the rate of corrosion in all types of metals subjected to the corrosion effects of various liquids or gases. The amount of corrosion that may take place in 5 or 10 years of field use can be predicted in a few hours. It is essentially a sensitive electronic Wheatstone bridge circuit. Probes have one protected corrosion strip and one exposed corrosion strip. Automatic temperature compensation is obtained from the protected strip. The corrosion on the exposed strip causes the meter to indicate directly in micro inches of penetration. Probes holding the protected and unprotected metals are available in all types, for long or short test periods, and for high or low temperature. All controls are housed in a steel case, fully enclosed, with all contacts protected from corrosive atmospheres. Standard models are wired for 115 volts, 60 cycles ac, but may also be obtained with batteries for field work. The unit weighs 12 lb. The price of the tester, less probes, is $495. Probe prices depend on the type required for the specific application.

Diethylamine inhibits gas well casing corrosion

Considerable corrosion difficulty in experienced in the upper part of the annular space between the casing and tubing of gas and oil wells. This space is filled with moist gas frequently containing hydrogen sulfide and carbon dioxide, and the corrosion is localized where water collects in condensed droplets or in a joint or crevice so that perforation of the pipe wall can occur rapidly. L. W. Jones and J. P. Barrett of Stanolind Oil & Gas Co., Tulsa, have reported successful results from research into the use of volatile amines as corrosion inhibitors in this environment which does not lend itself to control by liquid inhibitors, cathodic protection, etc.

Numerous amines were tested at laboratory scope in corrosion cells in which steel coupons were exposed to simulated corrosive liquid and gases. Various amines were added in several concentrations at controlled temperatures. Blank tests (without inhibitor) were included. The weight loss of the coupons was determined and from that, and the blank tests, a percent inhibition was calculated, which in some instances came out to better than 90 per cent. The aliphatic amines gave better inhibition than did the cyclic amines, and diethylamine was judged to be the most promising because it produced good inhibition at concentrations as low as 50 ppm, was completely miscible with oil and water, and would readily vaporize.

A following series of field tests confirmed the practical and economic value of using this inhibitor, and developed means of injection and control. A 25 per cent diethylamine-kerosene solution is injected into the casing-tubing annulus. The amine vaporizes into the gas space, and the required amount and necessary frequency of addition is determined by analyzing withdrawn gas for amine vapor, using a simplified testing procedure. One group of wells, with closed casings, has been satisfactorily inhibited by addition of 1½ gal. of inhibitor solution every 2 weeks, at a total cost of $36 per well per year. As an extension of this, a combination treating liquid has been developed using a second amine which stays in solution. When the liquid is injected into the casing-tubing space the volatile diethylamine is liberated into the vapor space and the other amine remains in the liquid phase and inhibits the lower liquid-filled portion of the annulus.

GAS calendar

January

Pennsylvania Natural Gas Men's Association Annual Meeting—Wm. Penn Hotel, Pittsburgh.

18. Oklahoma Utilities Association Accounting Section (Place not set yet).

18. SGA Employee Relations Roundtable Conference—Statler-Hilton Hotel, Dallas.

23. NEGA Operating Division—Hotel Statler, Boston.

25. SGA Accident Prevention Roundtable Conference—Tutwiler Hotel, Birmingham, Ala.

25. Pennsylvania Gas Association Mid-winter Sales Conference—Benjamin Franklin Hotel, Philadelphia.

31. NEGA Accounting Division—Hotel Statler, Boston.

February

3- 5. 27th Annual Mid-Winter Conference, Public Utility Buyers Group, National Association of Purchasing Agents—Brown Hotel, Louisville, Ky.

4- 6. AGA Home Service Workshop—King Edward Sheraton Hotel, Toronto, Ont., Canada.

13-15. Eighth Annual Tulsa Corrosion Short Course for Pipeliners—Mayo Hotel, Tulsa.

21-22. SGA Accounting Management Roundtable Conference—Roosevelt Hotel, New Orleans.

21-22. SGA Sales Executives' Conference—Roosevelt Hotel, New Orleans.

March

7- 8. SGA Transmission Management Roundtable conference—Roosevelt Hotel, New Orleans.

7- 8. SGA Distribution Management Roundtable Conference—Roosevelt Hotel, New Orleans.

11-15. National Association of Corrosion Engineers—Kiel Auditorium, St. Louis, Mo.

21-22. New England Gas Association Annual Meeting—Hotel Statler, Boston.

25-27. AGA General Management Section—Edgewater Gulf Hotel, Edgewater Park, Miss.

25-27. Mid-West Gas Association—Hotel Nicollet, Minneapolis.

28-29. Oklahoma Utilities Association Annual Convention—Tulsa.

April

8-10. National Conference of Electric and Gas Utility Accountants—Sheraton-Park Hotel, Washington, D. C.

8-10. GAMA Annual Meeting—The Greenbrier, White Sulphur Springs, W. Va.

8-11. AGA Distribution, Motor Vehicles and Corrosion Conference—Rice Hotel, Houston.

14-17. .Texas Independent Producers & Royalty Owners Association—Galves & Buccaneer Hotels, Galveston.

16-18. .Southwestern Gas Measurement Short Course—College of Engineering, University of Oklahoma, Norman.

16-18. .AGA Sales Conference on Industrial and Commercial Gas—Jung Hotel, New Orleans.

24-26. .Natural Gasoline Association of America 36th Annual Convention Rice Hotel, Houston.

25-26. .Indiana Gas Association—French Lick-Sheraton, French Lick, Ind.

29-May 1. .Southern Gas Association Annual Convention — New Orleans.

May

Natural Gas & Petroleum Association of Canada—Hotel London, London, Ont., Canada.

6- 7. .AGA Residential Gas Section Eastern Sales Conference—Hotel William Penn, Pittsburgh.

7- 9. .AGA Research & Utilization Conference—Cleveland, Ohio

8-10. .Joint AGA-PCGA Gas Supply, Transmission & Storage Conference—Mark-Hopkins Hotel, San Francisco.

15-17. .AGA General Management Section Conference — Jung Hotel, New Orleans.

20-22. .AGA Mid-West Regional Gas Sales Conference — Edgewater Beach Hotel, Chicago.

20-22. .AGA Chemical, Engineering and Manufactured Gas Production Conference — Balmoral Hotel, Miami Beach, Fla.

20-23. .29th Annual Exhibit of the Oil & Gas Power Division of ASME—Kentucky Hotel, Louisville.

21-23. .Pennsylvania Gas Association Annual Meeting—Pocono Manor Inn, Pocono Manor, Pa.

June

23-27. .Canadian Gas Association—Jasper Park Lodge, Jasper, Alberta, Canada.

24-25. .Michigan Gas Association — Grand Hotel, Mackinac Island, Mich.

September

3- 4. .Pacific Coast Gas Association Annual Convention—San Francisco.

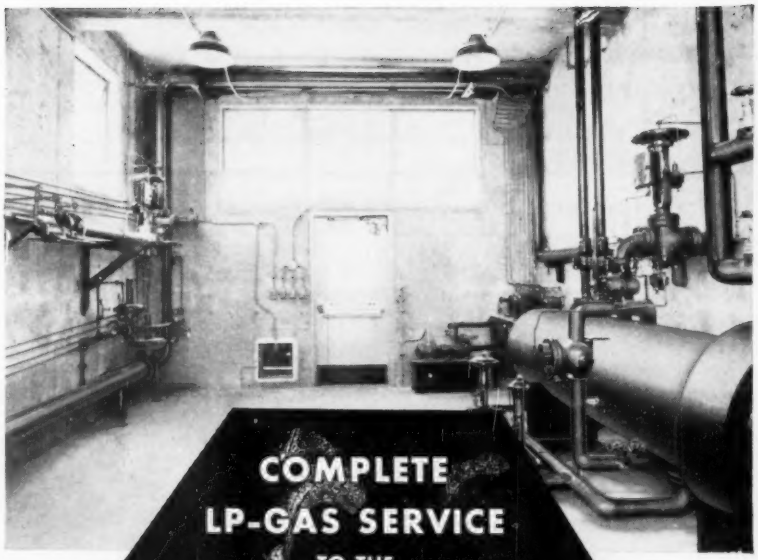
6. .New Jersey Gas Association Annual Meeting—Spring Lake, N. J.

9-13. .AGA Industrial Gas School—Hotel William Penn, Pittsburgh.

11-13. .Mid West Gas Association Gas School and Conference—Iowa State College, Ames.

October

7- 9. .AGA Annual Convention—Kiel Auditorium, St. Louis, Mo.

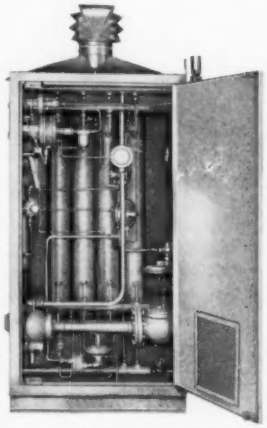


COMPLETE
LP-GAS SERVICE
TO THE
NATURAL GAS INDUSTRY

PLANTS FOR GENERAL UTILITY, PEAK-LOAD SHAVING, OR STAND-BY USE

Working hand in hand with the natural gas industry, ALGAS stands ready at all times to provide complete engineering service for every type of LP-Gas plant problem. Regardless of the application you will find ALGAS experience covers the type of service or installation required.

ALGAS service to public or privately owned utilities is becoming as important as that which it gives to industry. There are many different ways in which ALGAS serves the natural gas industry, everything from providing supplemental service for peak-load shaving to serving as a general utility in outlying districts. ALGAS equipment ranges from single 2500 CFH capacity Vaporizer-Mixers to complete LP-Gas plants delivering several hundred thousand feet of gas per hour and hundreds of thousands of gallons of LP-Gas storage. Consult ALGAS on all your LP-Gas plant requirements.



ALGAS LP-GAS VAPORIZER MIXERS

are automatic, self-contained, engineered and manufactured for outdoor, year 'round service; for any B.T.U.; for high or low pressures. Write for information on equipment to meet your specific needs.

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NATURAL GAS

AMERICAN LIQUID GAS CORPORATION
1109 Santa Fe Avenue • Los Angeles 21, California

GAS news

Liquefied natural gas tanker code under study

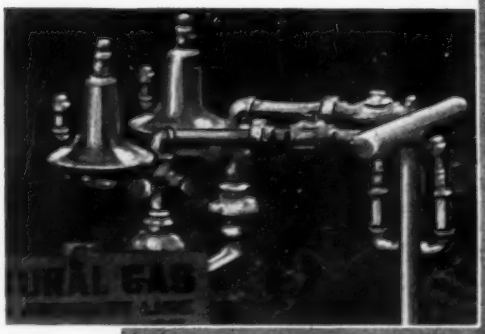
One of the major steps in the move to transport liquefied natural gas will be taken when the U. S. Coast Guard's tentative, informal code on LNG tankers has been analyzed by the American Petroleum Institute. Upon receipt of the API's comments and suggested changes, the Coast Guard will be in a position to approve or reject actual tanker specifications.

Although no company is ready to go ahead and construct LNG tankers, interest is running high, particularly on Middle East gas where billions of cu ft are flared off annually.

First utilization of the new code is expected to be made by a New York company — Constock Inc. — operating a pilot barge with thermos-type tanks at Pascagoula, Miss. Under USCG safety regulation, Constock plans to move LNG up the Mississippi to Chicago, where the gas will be used as a refrigerant in the stockyards.

The current problem is to perfect liner and insulation materials adequate to meet government safety requirements. An aluminum alloy is the forerunner among liner materials, but others being considered are copper, nickel, high nickel, and steel alloys. Insulation would be a solid material such as cork, some plastics, or in the case of small tanks, a vacuum.

A WIDER RANGE
... of Delivery Pressure Control



REYNOLDS HIGH PRESSURE LINE REGULATORS in parallel hookup have an increased range of capacity as well as a wider range of delivery pressure control. This also provides greater margin for emergencies. On inlet pressure the range is up to 650 pounds. For outlet pressure, this unit assures absolutely accurate and dependable control from 2 to 100 pounds. This variance in outlet pressure is made by use of different sizes of diaphram cases and further flexibility in the spring type is possible by use of different strength springs.

BRANCH OFFICES

H. D. "MIKE" MEUFFELS
423 Dwight Building
Kansas City, Missouri

SEIDENGLANZ & CO.
2nd Unit, Santa Fe Building
Dallas, Texas

REPRESENTATIVES

EASTERN APPLIANCE COMPANY
Boston, Massachusetts

WALDO S. HULL
163 W. Queen Lane
Philadelphia, Pennsylvania

Reynolds Gas Regulator Co.
ANDERSON, INDIANA, U. S. A.

GAS CONTROL SINCE 1892

Economists predict rising costs for coal and oil

Price increases for the two principal fuels competing with natural gas are expected by government economists.

Oil—from crude possibly all the way to gasoline—is expected to be more expensive as European countries bid up prices to replace supplies they have lost through closure of the Suez Canal. Some of the increases may be substantial, others rather minor, government officials say.

Coal, too, may be due for a rise in price. Officials are being told by coal producers that the industry doubts that increased productivity can keep pace with rising costs of production. Wages are up $12 a day over 1948, not including fringe benefits; transportation and supply costs are up, but the price of soft coal is about what it was in 1948, the industry says.

No date for coal price rises has been forecast, but if production costs continue to rise, and inflation continues to push up other costs, it could come within a year or so, the experts guess.

Western Kentucky Gas occupies new building

Late last year, Western Kentucky Gas Co. moved into its new modern general office building, highlighting the company's 22nd year of operation in Owensboro, Ky. Organized in 1934, Western Kentucky has grown steadily from initial service to about 2000 customers in 18 com-

LEADING GAS MEN PREFER

NEW... PLASTIC { Handley-Brown CURB BOXES CATHODIC TERMINAL BOXES

WITH MAGNETIC TOP FOR EASY LOCATION

Now you can reduce the danger of car or truck wheels breaking curb cocks and speed up the locating of curb boxes in an emergency by equipping your services with Handley-Brown Kralastic Curb Boxes. Yes, these new curb boxes eliminate damage to curb cocks and service piping because Kralastic, the amazing resin-rubber compound, is non-corrosive, permitting the telescoping sections to collapse when necessary. Since it is non-corrosive, the nuisance of hard-to-remove caps vanishes. They're easy to find, too! Powerful, permanent, built-in magnets assure a fast-locating reaction. You'll also be pleased with the magnet-equipped Handley-Brown Kralastic Cathodic Terminal Boxes because their unique design provides for simplified Cathodic protection testing. Test leads are fastened to a terminal block in the cap which is readily tilted for testing. You'll save on handling expenses too, because Kralastic Boxes are extremely light . . . Kralastic weighs 1/7th that of cast iron. And the boxes cost less! Write today for full information.

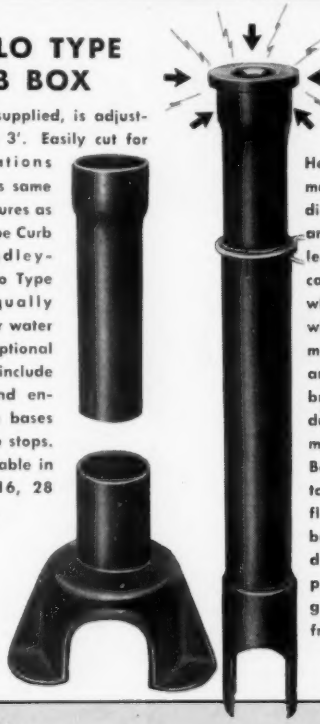
EXTENSION TYPE CURB BOX

Curb Box, as supplied, is adjustable from 2' 3⅝" to 3' 8". Kralastic is easily cut for shorter installations down to 1'. Caps are readily removable with standard pentagon wrench and are tamper free. High arch design of base provides ample clearance for curb stop and allows use of foot piece. Equipped with powerful permanent-type magnet, making it easy to find.

*PAT. APPLIED FOR

BUFFALO TYPE CURB BOX

This model, as supplied, is adjustable from 2' to 3'. Easily cut for shorter installations down to 1'. Has same outstanding features as the Extension Type Curb Box. The Handley-Brown Buffalo Type Curb Box is equally suited for gas or water installations. Optional accessory items include extensions and enlarged cast iron bases for oversize curb stops. Extensions available in lengths of 9, 16, 28 and 33 inches.



CATHODIC TERMINAL BOX

Here's a compact unit with a built-in magnet that really simplifies cathodic protection testing and is easy to find. Test leads are secured to the cap's terminal block which is easily tilted when testing. Wire movement is minimized and chances of wire breakage greatly reduced. Flush to ground mounting of Terminal Box prevents accidental damage. Specially flared end keeps the box from being accidentally turned or pulled out of the ground and resists frost heaving.

Write for full information

H-B HANDLEY-BROWN HEATER CO.

JACKSON, MICHIGAN, U.S.A.

SERVING THE GAS INDUSTRY FOR OVER THIRTY YEARS

munities to more than 60,000 domestic and industrial consumers in 53 communities.

After the official opening ceremony, the company was host to people of Owensboro and the surrounding area during a three-day openhouse period.

Constructed of structural steel and concrete, the contemporary building is finished with exterior walls of Roman brick and Indiana limestone. Full-view plate glass windows add to the exterior and interior decoration and on the ground floor serve as show windows for the modern gas appliances displayed by the local offices of the company.

Western Kentucky Gas Co.'s new building has a "first" for any utility in Kentucky in its drive-in bill payment window. The Owensboro *Messenger and Inquirer* referred to the building as the "most modern" in the city.

Included in the properties of Western Kentucky are more than 860 miles of gas mains, two underground gas storage reservoirs, and 15 appliance stores. Kengas Inc., an L. P. gas subsidiary, was established in 1955 as a market-building move to match the trend toward suburban living. Kengas operates six district offices that serve approximately 16,000 customers.

Utility seizure law urged by Ohio governor

Ohio's Governor Lausche has called a special session of the Ohio legislature to consider enactment of a law empowering the governor to seize and operate public utilities hit by strikes.

The proposed legislation would be patterned after a Virginia law which empowers the governor to seize a utility and operate it with either regular employees or state employees in case of emergency.

"There is substantial uniformity," the governor said, "in the conviction that Ohio needs a law that will cope with the intolerable situation that exists when a utility company and a union stubbornly refuse for a protracted period to reach a settlement."

Governor Lausche's move was prompted by a protracted strike against the Ohio Consolidated Telephone Co.

(*News continued on page 72*)

FOR THE **BIG 42" JOBS**

or the small 3/8" ones

Norwalk *Engineered* Valves keep gas and air under positive control

For more than 75 years, Norwalk valves and Norwalk engineers have controlled the flow of gases and air at high and low pressures in pipe sizes from ⅜ to 42 inches. Every Norwalk valve is precision engineered and built to give long years of trouble-free, safe, dependable service at practically no maintenance cost.

Quick delivery, engineering know-how and experience is available from 11 Norwalk factory branches to meet every flow problem.

When you have a flow control problem — ***Call Norwalk***

NORWALK VALVE CO.
Established 1878
SOUTH NORWALK, CONN.
Boston • Chicago • Cleveland • Detroit • Los Angeles
Minneapolis • New York • Philadelphia • Pittsburgh
San Francisco • Washington, D.C.

INDUSTRY'S COMPLETE LINE

Check Valves
Pipe Sizes ⅜" to 42". Screwed end Models to 4".

Manometers
Pressure or Vacuum.

Pressure Controllers
Pressures to 5 psi.

Appliance Regulators
Pipe Sizes ½" to 2".

Station Regulators
Pipe Sizes 3" to 24". Liquid Seal or Diaphragm Types.

Relief Valves
Pipe Sizes ½" to 24".

Filters
Pipe Sizes ½" and up.

Complete Engineering Cooperation

Gas Digest

A digest of what's new in products and trade literature compiled by the editors of GAS as a reader service.

New Products and Trade Literature

For more data on any of these items use the Readers' Service Card on pages 69, 70

1. Millivoltmeter

Direct, accurate, in-the-field measurements of very small potentials associated with corrosion problems can be made with a new battery-operated vacuum tube millivoltmeter produced by Fisher Research Laboratory. The instrument is mounted in a leather carrying case.

Essentially infinite input resistance, 10 megohms, on all ranges provides minimum disturbance to the circuit under test. Six full scale ranges between 0-25 and 0-1000 millivolts and two additional ranges, 0-10 and 0-100 volts, are provided.

Fisher Research Laboratory

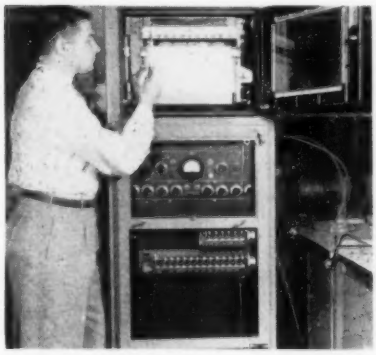
2. Handwheel operator

Conoflow Corp.'s new Cono-Clutch handwheel operator is available as an integrally mounted accessory for the company's standard line of cylinder Conomotor actuators. The cylinder Conomotor, a pneumatically positioned power actuator, is used for throttling control on numerous types of valves, motor-driven speed changers, proportioning pumps, flow regulators, rheostats, and autotransformers.

The Cono-Clutch hand operator affords immediate manual control in the event of air failure. Clutching and declutching are accomplished by pulling or pushing a knob located on the face of the unit.

Conoflow Corp.

3. Gas chromatograph

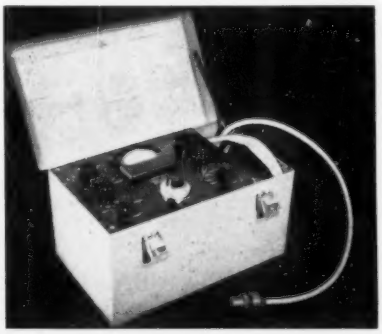


Industrial gas streams can be analyzed with a continuous gas chromatograph designed specifically for industrial processes by Beckman Instruments scientific instruments division.

With the gas chromatograph, each sample is automatically passed through a packed column of absorbent material which breaks the mixture into its component parts, and then registers on a graph the percentage of each chemical component present. This information, according to Beckman, can be fed into a relatively simple control system which can keep track of the reaction and automatically correct any deviations.

Beckman Instruments Inc.

4. Corrosion meter



A new instrument for measuring electrically the progress of corrosion under a variety of conditions is announced by Crest Instrument Co.

The Corrosometer, as it is called, is used in conjunction with special probes containing metal specimens which are subject to corrosion. Probes of more than 30 metals and alloys are available. These are supplied in a number of designs to meet the varying pressure and temperature conditions of different systems.

In use the Corrosometer follows the progress of corrosion on the probe by measuring the loss of metal directly in microinches of penetration into the metal. The measurement is based on the increase in electrical resistance of a

metal as corrosion takes place.

Three models of the meter are available, one for field use, one for laboratory use, and a continuous recording unit designed to give a visual reading as corrosion takes place.

Crest Instrument Co.

5. Air valve

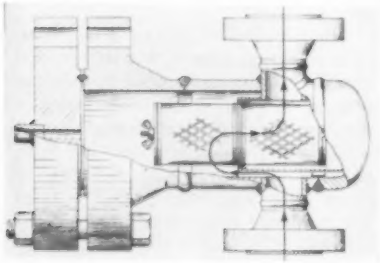
Barksdale Valves has added a 1½-in. 4-way valve for 0 to 250 psi service to its line.

The Shear-Seal principle, which consists essentially of a pressure-balanced, self-aligning tubular sealing ring, is incorporated in the valve.

Because flow is through the Shear-Seal and never across sealing surfaces, and because the square external corner of the seal wipes the rotor clean, Barksdale reports that no dirt can enter between the sealing surfaces to cause scoring and destroy sealing qualities.

Barksdale Valves

6. Gas filter

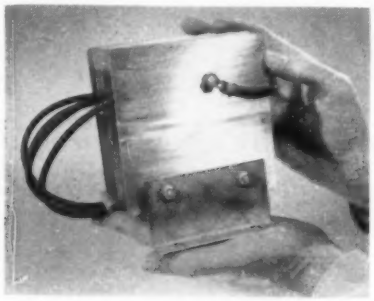


Contaminates are removed from gaseous streams by a new high pressure filter which also protects turbine expanders, compressors, pumps, nozzles and blowers in process industries.

Developed by Purolator Products, the resin-impregnated cellulose filter elements have a 99 per cent efficiency rating. The elements are protected for heavy duty application by an expanded metal outer cover and are contained in housings manufactured according to ASME boiler and pressure vessel code specifications.

Purolator Products Inc.

7. Rectifier



Holcombe Co. has introduced a new type rectifier for cathodic protection.

Silicon diodes and stacks are used. Higher operating temperature characteristics minimize deterioration in hot climates. The unit in the photograph will handle 170 v at 40 amp dc.

Holcombe Co.

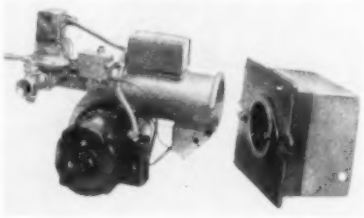
8. Tape input-output unit

A new high speed paper tape console, consisting of a 400-character/second photoelectric reader and a 60-character/second punch, makes possible an 1800 per cent increase in the input speed and a 500 per cent increase in the output speed of the ALWAC III-E electronic digital computing system.

The Logistics Research unit provides a rapid read-in and punchout of data on paper tape and greatly increases the volume of productive computing time because the speed of the computer is not delayed by slower input and output devices.

Logistics Research Inc.

9. Incinerator burner

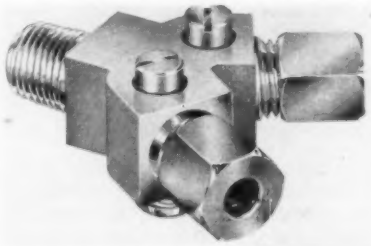


Eclipse Fuel is making completely packaged Series 600 SIB incinerator burners which have been developed particularly for commercial and industrial incineration applications.

To put the packaged unit into operation requires only the hooking up of gas and electricity. An integral fan supplies all combustion air. The six sizes of Series 600 SIB burners have rated capacities adjustable from 100,000 to 500,000 Btu/hr with a seventh size having a capacity to 900,000 Btu/hr.

Eclipse Fuel Engineering

10. Pilot adjustment valve



Recently added to the Anderson Brass "Detroit" line of gas valves and fittings is the No. 1305 "Y" pilot adjustment valve.

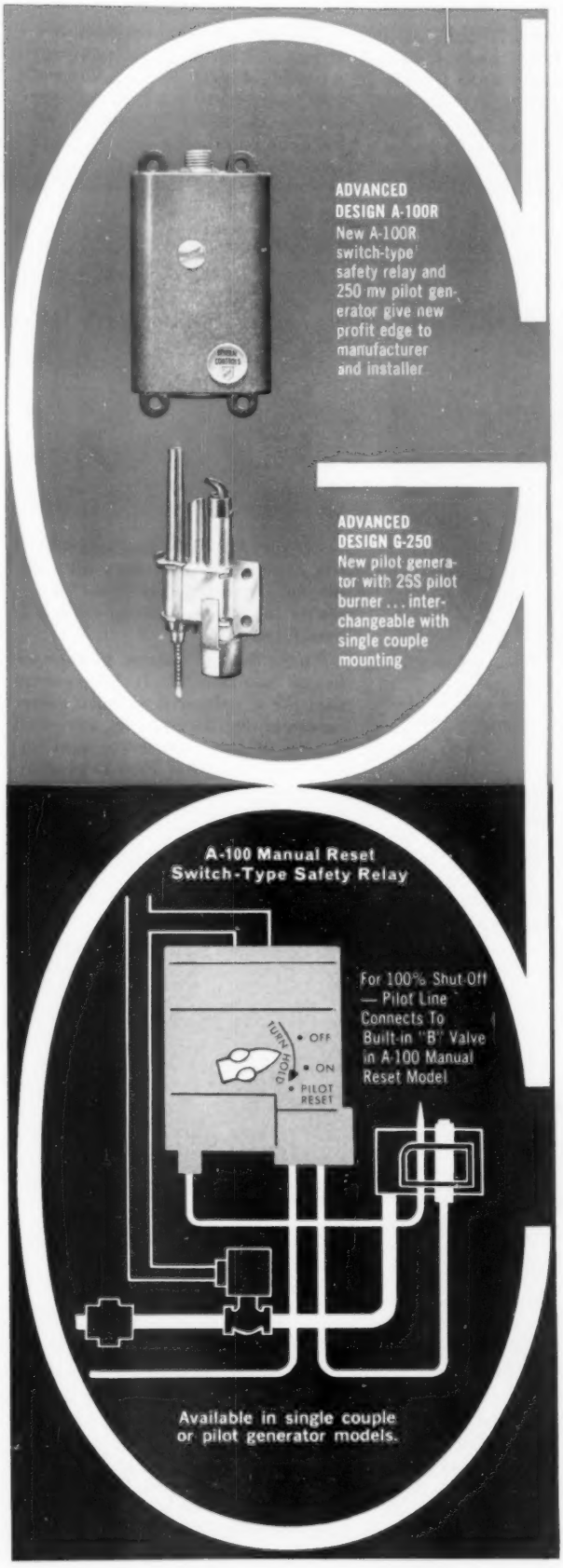
The new valve eliminates one filter and one manifold tapping when used on a divided top range that requires two pilots for the flash tubes.

Anderson Brass Co.

11. Industrial thermostat

A new industrial thermostat from General Electric is designed for such applications as deep fat fryers, coffee urns, ovens, sterilizers, water and oil heating, metal platens, process ovens, degreasing tanks, melting pots, and compressed air heaters.

Copper bulbs and capillaries are supplied for applications up to 250°F, and steel bulbs and capil-


ADVANCED DESIGN A-100R
New A-100R switch-type safety relay and 250 mv pilot generator give new profit edge to manufacturer and installer
ADVANCED DESIGN G-250
New pilot generator with 25S pilot burner ... interchangeable with single couple mounting
A-100 Manual Reset Switch-Type Safety Relay
For 100% Shut-Off — Pilot Line Connects To Built-in "B" Valve in A-100 Manual Reset Model
TURN KNOB
• OFF
• ON
• PILOT RESET
Available in single couple or pilot generator models.

INSTALLERS! MANUFACTURERS!

Profit from new advanced design switch type safeties

Installing or Servicing Gas Furnaces? Make big savings with General Controls' new A-100R Safety Relay *with automatic reset!* First, you'll eliminate a lot of unnecessary service calls on false safety shut-downs. Second, you'll find extra *folding-money profits* in replacing old fashioned electric safeties with the low cost A-100R. Ask your wholesale supplier for this profitable General Controls A-100R—G-250 "safety package" today!

OEM's Benefit Too! There's a wonderful *system simplicity* for original equipment manufacturers when they use the A-100 Series switch-type safeties. Eliminated are the double and triple inventories and pressure-drop problems of mechanical safeties. Labor is less. Material is less. And... when you use the G-250 Generator—26S Pilot Burner combination, you lower costs even more!

And Yet Another Advantage: In the Manual Reset version of the A-100, there's a *brand new* feature... 100% safety shut-off. A *built-in* "B" Valve is available right in the safety relay!

SEE THE A-100 SERIES NOW! Whether you are servicing or manufacturing... see your wholesaler or call in your nearby General Controls Factory Representative.

America's Finest Automatic Controls for Home, Industry and the Military

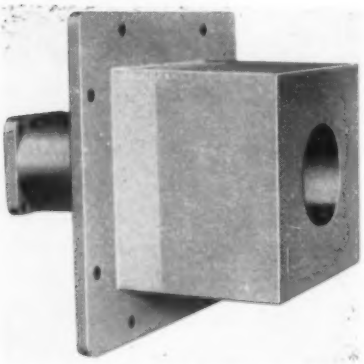
GENERAL CONTROLS

Factory branch offices serving *all* principal cities of the United States and Canada.

Five Plants: Glendale, California • Burbank, California • Iron Mountain, Michigan • Skokie, Illinois • Guelph, Canada •

laries for use up to 700°F. Switching mechanism of the unit is double-pole, single-throw, snap-action, normally closed or normally open, for ac operation. Thermostats can also be ordered for dc operation.
General Electric Co.

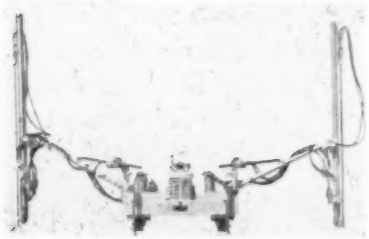
12. Tunnel burner



Specifically designed for firing into pressurized combustion chambers with zero leakage is Bryant Industrial's new line of totally enclosed tunnel type gas burners.

Capable of effecting complete combustion in a furnace chamber pressurized up to 50 psi, the GA series Pyronic burners are available in 18 sizes. They have a capacity range from 4000 to 2 million Btu/hr and are designed to operate efficiently without special adjustment anywhere in the 540-3200 Btu gas range, simplifying problems of furnace design, fuel changeover and standby operation.
Bryant Industrial Products

13. Drill rig

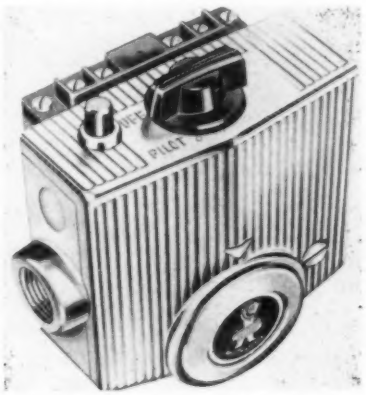


A self-propelled dual drill rig which is designed for fast drilling speeds in hard formations and easy maneuverability over rough terrain is being marketed by the Le Roi division.

The new drill rig is available with one or two Le Roi-Cleveland air feeds mounted on a crawler tractor powered with a 28 hp gasoline engine. The tractor, with three forward speeds and one reverse, can be used for light tractor work when not drilling.

The T286 drill has the new heavy-duty DR40 feed, which has a 10-ft travel and 8-ft steel change as standard equipment.
Le Roi Division

14. Furnace control

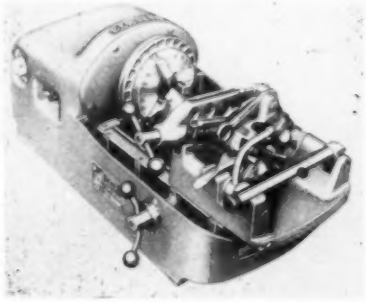


Robertshaw-Fulton has a new automatic gas heating control for use with warm air furnaces.

The Unitrol Model 400-E combines gas cock, thermostatic valve and automatic pilot in a single compact unit. The control's thermostatic valve operates (on the heat motor principle) on 24 volts ac, and is suitable for use with all types of room thermostats.

Additional features include snap-action gas valve for positive and completely silent performance and a 100 per cent shutoff-type automatic pilot.
Robertshaw-Fulton Controls Co.

15. Pipe and bolt machine



Beaver Pipe Tools' new portable pipe and bolt machine threads ⅛- to 2-in. pipe, ¼- to 2-in bolts up to 12 in. with a drive shaft. The Speed-O-Matic's new motor is said to give at least 50 per cent more speed.

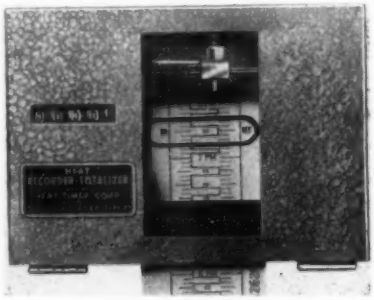
Standard equipment on the machine is Beaver's new power-grip wrenchless grip. Cutoff, dieheads, and reamer are all pivot-mounted, making the Speed-O-Matic an ideal make-up machine.
Beaver Pipe Tools Inc.

16. Air compressor

Jaeger Machine has announced the availability of rotary air compressors as large as 250-cfm capacity mounted on easily trailed 2-wheel trucks.

There are no valves, pistons or heavy crankshafts. It is reported that air is delivered at much cooler temperatures. In addition, advanced design of the compressor unit enables this Roto-Air Plus to produce full rated volume at 100 to 150 rpm slower operating speeds.
Jaeger Machine Co.

17. Heat recorder



A continuous, permanent record of the operations of a heating system is made by the Heat Recorder-Totalizer produced by Heat Timer Corp. and distributed by Enterprise Heat & Power Corp.

The Heat Recorder-Totalizer is a precision-built instrument which automatically records the time the heat goes on, how long it is on, and when it goes off and for how long. It is applicable to all boiler room equipment—pumps, compressors, air conditioning equipment.
Enterprise Heat & Power Co.

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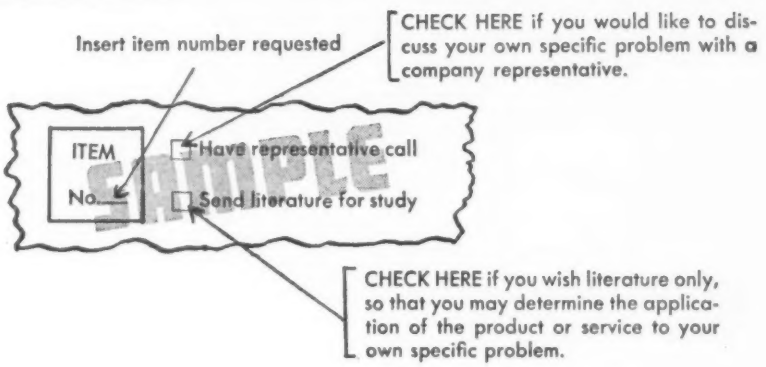
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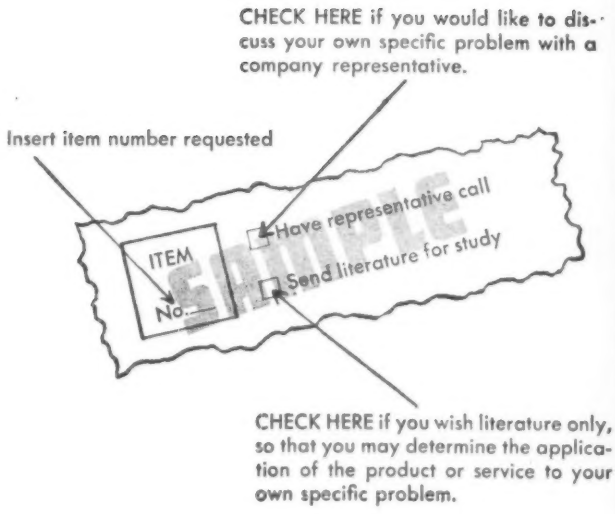
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Send literature for study
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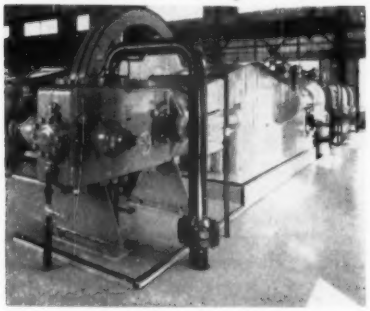
GAS Digest • *Cont'd.*

18. Modernized compressors



Cooper-Bessemer Corp. is applying compressor cylinders built of nodular iron to older horizontal-type compressors which can then be converted to handle 2000 psi for modern transmission and gas storage service.

The compressor cylinders designed for 2000-psi service are supplied by Cooper-Bessemer for its own Type 22 units. They are reportedly the first kind to be constructed of nodular or ductile iron. Previous to this time, compressor cylinders built of cast iron have been limited largely to 1000-psi service. Cast steel cylinders have been used where pressures up to 2500 psi were anticipated.
Cooper-Bessemer Corp.

19. Crane shovels

Three new power crane-shovel models have been announced by the Quick-Way Truck Shovel Co. One, the Quick-Way 85A (pictured), is a truck-mounted 4/10 cu yd, 8½-ton convertible crane shovel. Model 105AC is a crawler-mounted version of the 5/10 cu yd model 105A. The company will also offer the 85AC, a 4/10 cu yd crawler-mounted shovel.

The new 85A, combining mobility with easy maintenance, offers many new features designed with the operator in mind. Complete 360° vision, good ventilation, conveniently grouped controls and instruments, and light pressure hydraulic clutch controls enable the operator to have more comfortable working conditions.
Quick-Way Truck Shovel Co.

TRADE LITERATURE

20. Plug valve catalog

A new 28-page catalog from Homestead Valve shows 100 per cent pipe area, venturi, round port, and diamond port lubricated plug valves in a variety of metals. Complete with engineering dimensions, this catalog (Section 5 of Reference Book 39) also shows different types of power operators for valves, in addition to complete lines of lever-operated and worm- and gear-operated valves.
Homestead Valve Manufacturing

21. Corrosion booklet

Corrosion Services Inc. has published a booklet describing the services and materials it offers. Casing protection, pipeline protection, magnesium anodes, and selenium rectifiers are some of the services and materials described and illustrated in the booklet.
Corrosion Services Inc.

22. Engine literature

The first four of a series of engine case histories have been published by the Le Roi division of Westinghouse Air Brake Co. The case histories cover the entire line, ranging from 75 to 675 hp. Pictures and drawings are used in the two-page histories to illustrate applications of the engines.
Le Roi Division

23. Catalog of controls

Minneapolis-Honeywell has published its enlarged edition of the residential controls division's 1956-57 catalog of automatic controls. The catalog's 108 pages are printed in two colors and have been laid out to give maximum legibility. Descriptive matter and illustrations are arranged to provide clear, concise product information, especially to the 59 new controls and package sets that were added to the Honeywell line in 1956.
Minneapolis-Honeywell

6 REASONS WHY MORE AND MORE COMPANIES NOW PICK

BUSADA Butyrate Plastic Pipes For Gas Lines

1. TRANSPARENT, SEMI-RIGID
Can't rust, corrode. Easier to inspect.
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With cold-welding solution and paint brush.
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'Dry-Air GAS
GRAVITOMETERS

This new Arcco-Anubis Dry Air Gas Gravitometer determines and records specific gravity of gases automatically corrected to the humidity content of the air. The difference in weight between a column of GAS and equal column of DRY AIR is measured. This ratio represents the true specific gravity of the sample.

One bell of the instrument is filled with gas which is being measured, and the other bell is filled with dry air. Otherwise, except for the new instrument having one column for gas and one column for dry air, the unit is identical in operation to the standard gas gravitometer. When calibrated and properly installed, these instruments require little attention other than to wind the clock, ink the pen, and change the chart. Send for bulletin No. 101.

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2" HANDLE & LOCKING SLEEVE
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news • *Continued*

from page 64)

Gas drops to 16th on list of fire causes

Only 2 per cent of the nation's building fires and losses in 1955 were attributed to gas, the American Gas Association reports. Careless smokers cause seven times as many building fires as gas and gas appliances.

Gas dropped from 14th to 16th in the National Fire Protection Association's list of 24 building fire causes, despite an 8.9 per cent increase in gas consumption. Gas was listed far below any other fuel, including electricity, used in home business and industry.

Building fires in 1955 mounted almost 5 per cent to 811,800 and caused total losses of $943,551,000.

Ohio Fuel co-sponsors all-gas home project

One of the largest single installations of residential gas air conditioning in the country is being made in a development of 101 all-gas homes in Columbus, Ohio. The cost of air conditioning is included in the purchase price of the speculative homes, which range in price from $20,000 to $32,000.

Cooperating with the five builders as co-sponsor of the project is Ohio Fuel Gas Co., which is using its information and promotion facilities to conduct an extensive campaign in the Columbus area to acquaint people with the new all-gas homes.

The first group of homes in the development had a two-week showing period recently. Before the opening of the model homes, Ohio Fuel sponsored an openhouse for the press, followed by one for all the suppliers involved in the project.

Gas company staffers escorted people through the houses, demonstrated the appliances and pointed out other unusual features. To supplement the personal tour, each house was equipped with a prerecorded tape message describing features of the house to visitors.

There are 28 basic floor plans and exteriors in the new development, and all homes will be fully equipped with gas appliances, including Roper sectional gas ranges, Servel All-Year air conditioning and gas refrigerators, Rex automatic gas water heaters, Maytag washers and matching gas dryers.

Washington (D. C.) Gas Light Co.'s president, E. J. Boothby (left) was elected chairman of the board of trustees of the Institute of Gas Technology at its recent annual meeting. Shown with Mr. Boothby are Dr. J. T. Rettaliata (center), president of Illinois Institute of Technology and of IGT, and Dr. Martin A. Elliott, director of IGT.

Peoples Gas seeks funds for drilling operations

Peoples Gas Light & Coke Co., Chicago, is seeking authority to purchase up to $10 million of additional common stock in its subsidiary, Peoples Production Co., and also to enter into a $15 million bank loan agreement to provide the necessary funds for the stock purchase and to meet other needs of Peoples Gas or its subsidiaries.

Peoples Production is one of four companies in a group engaged in a development and exploration drilling program seeking gas and oil in submerged lands off the coast of Louisiana and Texas. A 5000-acre area in the Gulf of Mexico was described as having potential oil and gas production value exceeding the total current investment in the entire 35,000-acre site.

In the concurrent petitions filed with the Illinois Commerce Commission, Peoples Gas outlined the future plans of the drilling program. The exploration group is now planning to enter upon the second phase of its program involving the completion of developmental work already planned and now underway, further exploration and development of properties now under lease, the full utilization of existing geological and geophysical data, and the acquisition of attractive open acreage if and when such acreage is offered for sale.

Included in this future program is a plan for 1957 drilling and other operations which will cost approxi-

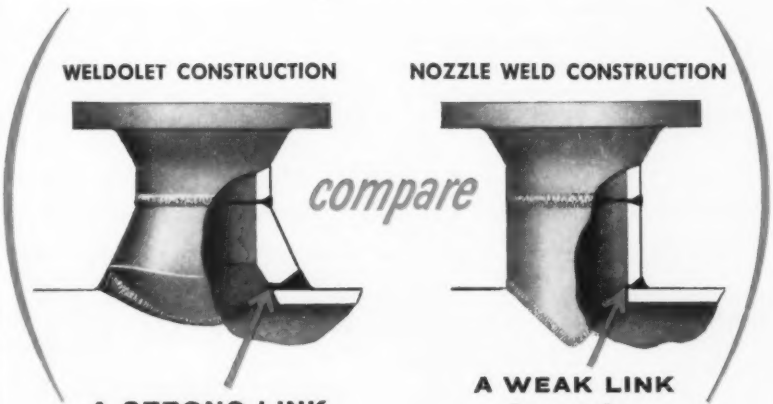
→ **years** to your piping

→ **gallons** to your flow

→ **strength** to an otherwise weak link

add → **BONNEY WELDOLETS**

to your piping drawings for all branch connections



A STRONG LINK
adds years
gallons
strength
and assures a clean, properly fabricated and properly designed branch connection

A WEAK LINK
for corrosion
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internal pressure

Labor costs are now at an all time high. Reevaluation of your piping costs will now reveal Weldolets 4" and smaller to be less costly to fabricate than unreinforced nozzle connections. In the field this is also true of larger sizes and Weldolets are always more economical than branch connections made by welding tees or reinforced nozzles. Weldolets are manufactured in all sizes from 36" and all weights from xxs, in carbon steel, stainless, alloy, wrought iron and non-ferrous metals.

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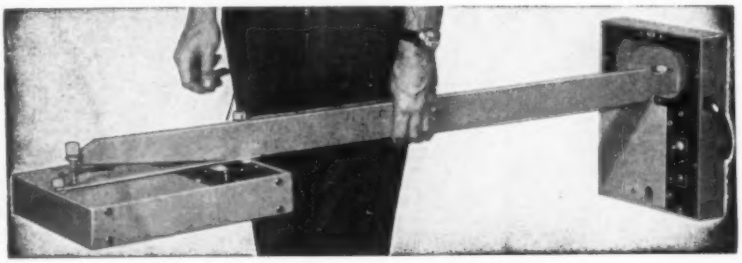
SEES AND TELLS

It will instantly locate all subsurface pipes, cables and such, and determine their depth too. The etched circuitry, our latest innovation, assures better quality control and performance than the customary hand wiring method. You can avoid damaged structures and loss of time with the Wilkinson Line Locator.



The new loop antenna is designed for greater selectivity and the printed circuitry eliminates the usual variations. These improvements make this instrument outstanding.

Our instrument cases are now made with wear resisting phenolic material.

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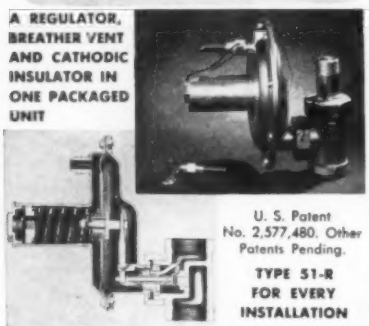
A REGULATOR, BREATHER VENT AND CATHODIC INSULATOR IN ONE PACKAGED UNIT



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Proved by USE!

Works in seconds! **Loosens Rusted Bolts** nuts, screws, "frozen" parts . . . . without breakage!

LIQUID WRENCH

A powerful blend of quick-acting solvents that frees "frozen" parts without breakage. Safe for all metals and alloys.

Makes joints LEAKPROOF! 7 BASIC BLENDS

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GASKET & JOINT SEALING COMPOUND

Makes all assemblies leakproof and pressure-tight. Easy to apply with brush-in-handle.

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Get them from your Automotive, Hardware or Plumbing Wholesaler!

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mately $14 million. It is also estimated that as much as $15.6 million may be spent for further lease purchases in 1957, if leases which the group believes have promise are offered by state and federal authorities.

The tentative 1957 budget of the operator provides for $400,000 for the operation of its New Orleans office and miscellaneous expenses. In addition, Peoples Production believes that $10 million may be required for further drilling and development operations in 1958 before the venture becomes self sustaining.

Teachers tour plant of Worcester Gas Light

Worcester (Mass.) Gas Light Co. shared the spotlight with 52 other business and industrial concerns recently when more than 600 school teachers and administrators from 17 adjacent communities paid visits to their plants on Worcester's first "Business - Industry - Education Day."

James J. Flanagan, assistant treasurer of the gas company, briefed the teachers on the operation of his utility. Then the teachers were divided into small groups and taken on a tour of both the administrative and operational parts of the plant. Each group was conducted to the commercial office, the customer location center, the distribution department and the utilization department. In addition, they were shown the meter proving shop and the telemetering section of the plant.

Atlanta Gas hits 300,000-customer mark

Atlanta (Ga.) Gas Light Co. celebrated its centennial fiscal year late in 1956 by passing the 300,000-customer mark and topping 1 billion therms in gas sales.

Throughout the 50 communities served, customers were up 7 per cent over 1955 to 305,280 and gas sales were up 5.7 per cent to 1,041,227,295 therms. In the Atlanta area, increase in customers from 1955 was 5.9 per cent to 190,854, reported Atlanta's president, R. G. Taber.

During the year, construction expenditures reached a record $8.4 million, two major projects being the Gasco and Riverdale propane-air plants in the Atlanta area. The

storage capacity of the Gasco plant, originally built in 1946, was increased from 38 to 78 tanks, with all the new tanks underground. Work on the Riverdale plant began last summer. It will be operating this winter.

Atlanta's growth has been sure and steady since 1945, with yearly expansion between 7 and 11 per cent except for two years. Over the past decade, number of customers has increased 280 per cent—from 116,000 to 305,280.

Fourth SoCounties division adds 100,000th customer

For the fourth time in its 45-year corporate history — and the fourth time in less than three years — Southern Counties Gas Co., Los Angeles, has marked connection of a 100,000th customer in one of its eight operating divisions.

The most recent celebration was held in the company's eastern division, when more than 200 civic dignitaries from 13 incorporated communities served by the division attended an open house at "The Lamplighter" model home in West Covina. The home is equipped with an all-gas kitchen.

Overall, SoCounties currently serves more than 574,000 customers. The other three divisions with more than 100,000 customers are Santa Monica Bay, San Gabriel Valley, and Orange county.

Oregon utilities want highway fund sharing

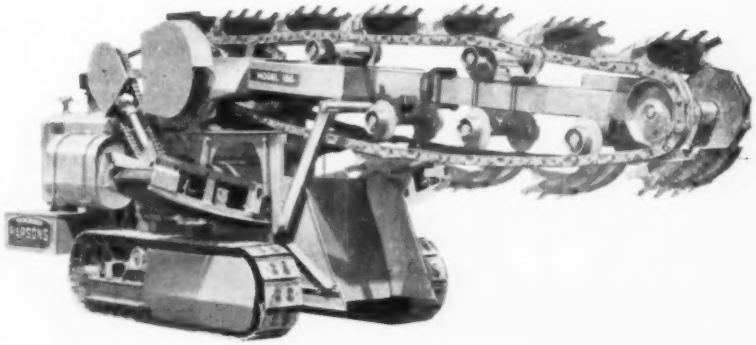
Oregon's public utilities are seeking state highway commission aid to assure enactment of state legislation which would permit the use of federal-aid highway funds for relocation of utility facilities affected by road construction.

A provision of the new federal highway act stipulates that where a state pays for the relocation of utility facilities on federal-aid or interstate highway systems, federal funds may be used to reimburse the state if such payment doesn't violate state law. Under present Oregon law, however, such payment would be illegal. A similar situation exists in 42 states.

Motor transport accident rate cut 14 per cent

A 14 per cent reduction in the motor transportation accident rate was recorded by the gas industry

working height only 7 FEET-4 inches



with NEW Parsons 155 Trenchliner®

Overall height (digging) 7'4"

Width (over crawlers) 5'4"

Trench widths from 16 to 26"

Maximum digging depth 10'

Production from 5.8" to 25 lineal feet per minute

Down-crowd boom (undercuts walks, curbs and gutters — makes vertical set-ins)

Self-sharpening, reversible "Tap-In" teeth

Power-shift spoil conveyor, reverse-direction belt (discharges to either side)

Dual-purpose friction clutch (drives bucket line, serves as automatic safety to protect against shock loads)

Full crawler mounting, with 12" flat shoes or 16" grouser type treads

Low ground bearing pressure (only 4.9 to 6.5 lbs. PSI overall length on crawlers)

Choice of engine (gas or diesel power available)

For work and travel in restricted operating areas, take a look at the low overhead clearance and narrow width of this new, small, ladder-type Trenchliner. It's compact, light in weight — yet brings you a big "plus" in digging widths, depths and speeds. Check its work capacity and heavy-duty features listed here — then ask your Parsons distributor to demonstrate what this utility-size 155 can do for you.

mail to: **PARSONS Company, NEWTON, IOWA** (Koehring Division)

Send us bulletin on the new 155 Trenchliner.

NAME_____ TITLE_____

ORGANIZATION_____ DIV._____

STREET_____

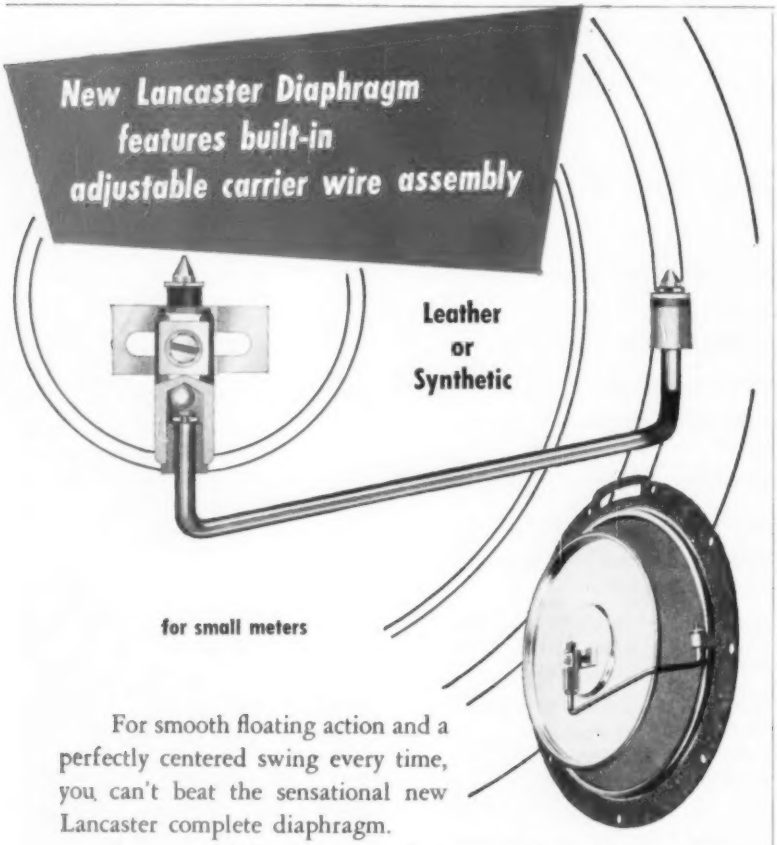
CITY_____ STATE_____ P572REV. GAS

during the past year. The AGA released the figure when it announced 15 awards won by the industry in the 25th annual national fleet safety contest conducted by the National Safety Council.

An accident frequency rate of only 1.58 per 100,000 miles of operation was credited to gas industry contestants with total operations of 291 million miles between July 1955 and June 1956. The gas industry figure of 1.58 was exactly the same as the overall rate of the contest, which included more than 1800 fleets whose 229,000 vehicles operated 4867 million miles.

Gas industry winners were Columbia Gas System Inc., Pittsburgh Group and Columbus (Ohio) group; Milwaukee Gas Light Co., among the "very - large" group. In the "large" group top companies were Pioneer Natural Gas Co., Amarillo, Texas; Kentucky West Virginia Gas Co., Ashland, Ky.; and Houston (Texas) Natural Gas Co. Tops in the "medium" group were Wisconsin Power & Light Co., Madison; Godfrey L. Cabot Inc. Appalachian division; Duluth, Minn. gas division of the water, gas and sewage treatment department. Small group winners were Concord (N. H.) natural Gas Corp., Elizabeth (N. C.) & Suburban Gas Co., and the River Gas Co., Marietta, Ohio.

In the transmission system group Alabama - Tennessee Natural Gas Co., Florence, Ala., was first, followed by Lone Star Gas Co. transmission division, Dallas, and Southern Natural Gas Co., Birmingham, Ala.



For smooth floating action and a perfectly centered swing every time, you can't beat the sensational new Lancaster complete diaphragm.

Just one of the important features is the built-in carrier wire assembly. It's an integral part of the diaphragm . . . only adjustment is at the center pan screw . . . saves time and labor . . . assures greater meter accuracy.

Send today for a sample of this first complete diaphragm and test it in your meter shop.

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Manufacturers of Quality Parts for Gas Meters
POST OFFICE BOX 378 LANCASTER, OHIO

Electric utility hikes natural gas purchases

In line with their desire to cooperate in the elimination of the smog problem in southern California, the two local gas companies have entered an agreement with the Southern California Edison Co. to fuel Edison's steam stations with natural gas.

Edison will buy an estimated $300 to $400 million worth of gas over a 10- to 18-year period from El Paso (Texas) Natural Gas Co., which will pipe the gas to the Arizona border. There it will be picked up by Southern California and Southern Counties Gas companies and transmitted via the Needles-to-Newhall (Calif.) line, which is scheduled for completion this year.

It is expected that deliveries will average 100 MMcf/day during the first five years, with further increases up to a maximum of 300 MMcf/day.

This latest contract follows an agreement signed in September by the Edison company and Richfield Oil Co. that calls for Richfield to supply an estimated $200 to $300 million of natural gas over a 20-year period (GAS, November 1956, p. 128). About 75 per cent of Edison's fuel supply will eventually be met by natural gas.

New preferred stock issued by Arizona PSCo.

Issuance of 200,000 shares of a new series of preferred stock convertible into common stock through Dec. 1, 1966 has been authorized by stockholders of Arizona Public Service Co., Phoenix.

Stockholders set the annual dividend rate at $2.40 for the new stock. At the same time initial conversion price of the issue was set at $23.

Walter T. Lucking, president of

news • *Continued*

the company, said that increasing demands for natural gas and electric power continue to require very substantial expansion of the Public Service facilities. He estimated that construction expenditures through 1958 would amount to $45.9 million. Of this amount, $8.9 million is destined for expansion of gas distribution facilities.

GAS news notes

Buffalo-Springfield Roller Co., Springfield, Ohio, has been merged into the Koehring Co., Milwaukee, bringing together two of the oldest manufacturers of construction machinery. Buffalo-Springfield will operate as a division of Koehring.

As a result of the Idaho supreme court decision that the co-op gas movement in that state is illegal (see GAS, December, pp 8 and 76), three of the 12 co-op cities have granted franchises to Intermountain Gas Co. The company is negotiating with nine other cities. Two other cases are pending in an Idaho superior court, but Intermountain attorneys believe the Idaho Falls decision will hold in both instances.

Oklahoma Natural Gas Co., Tulsa, plans a $51 million expansion program during the next five years. A major portion of the money will go to connect new customers to the distribution system. Also in the budget is a large outlay for an "aggressive search" for new reserves of gas and for research aimed at developing new uses for natural gas and improving equipment.

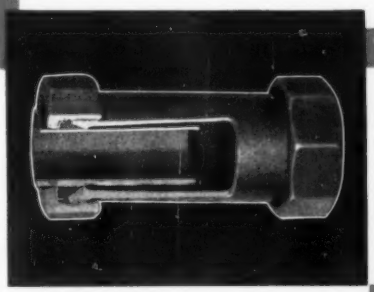
Arkansas-Missouri Power Co., Blytheville, Ark., will increase its natural gas supply by more than 60 per cent through a new connection with the MidSouth Gas Co. Ark-Mo serves portions of south Missouri and north Arkansas. MidSouth will act as the carrier for the additional quantities of gas which actually will be supplied by Texas Gas Transmission Co.

Roots-Connersville Blower division of Dresser Industries Inc., Connersville, Ind., has appointed G. M. Wallace & Co., Denver, as field application engineers for all R-C products. Territory includes Colo-

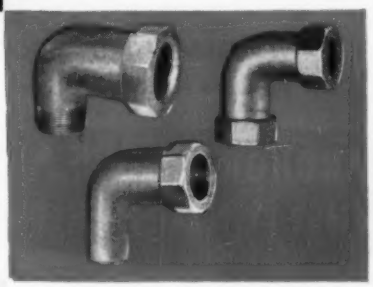
NORMAC

Couplings, Sleeves and Fittings for ☆ UNIFORMITY ☆ DEPENDABILITY ☆ ADAPTABILITY

Normac gas distribution products are engineered and manufactured to meet every requirement of modern gas distribution. Write today for catalog.

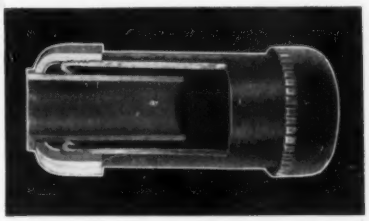


NORMAC COUPLINGS
Normac malleable couplings and sleeves offer the ultimate in deflection and strength with a center wall thickness greater than the wall thickness of the service pipe on which they are used. Every Normac fitting is individually air tested.



COMPRESSION-END "ELLS"
Normac ells of all types incorporate every feature of the Normac coupling plus full coupling depth.

COMPRESSION-END SERVICE "TEE"
Full coupling depth. Special threads on male end prevent dropping into old hand taps.



NORMAC #50-A STEEL COUPLINGS
Manufactured from extra heavy wall pipe. Couplings are available with either seamless or welded centers in sizes from ¾" to 1½" inclusive. 10" and special length centers available.

Normac also manufactures a complete line of red brass fittings in O.D. sizes: ⅝", ⅞", 1⅛", 1⅜"—and a complete line of insulated couplings and fittings.

NORTON-McMURRAY MFG. CO.
122 South Michigan Avenue — Chicago 3, Illinois

Couplings Meter Bars Sleeves Cocks Ball Joint Clamps Service Tees & Ells

"PANTHER" PLASTIC PIPE

. . ready to serve the pacific northwest with GAS service lines

ADVENT OF NATURAL GAS IN THE NORTHWEST, PUTS WESTERN PLASTICS CORPORATION IN AN EXCELLENT POSITION TO SERVE YOU!

Here is plastic pipe extruded to American Gas Association and the Society of Plastics Industry recommendations as to weight, dimensions and tolerances. There is no electrolysis with Panther Pipe and it is flexible, light weight, non-rusting and is a "natural" for gas service lines, either new installations or replacement of old lines. It can be joined to metal lines without expensive precautionary measures.

Enjoy the advantage of working closely with a local manufacturer who will meet all your requirements with this top quality plastic pipe. Write to us now for prices and more information.

Manufactured by

WESTERN PLASTICS CORPORATION

3510 Ruston Way, Tacoma 2, Washington

PANTHER ®

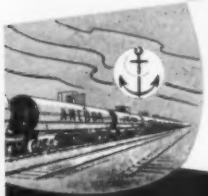
ANCHOR'S BUTANE & PROPANE STAND-BY PLANT PACKAGE

ENGINEERING, INSTALLATION

Anchor's Engineering Dept. will design and supervise plant construction.

FINANCING

Anchor's experienced staff will assist with the financial details . .



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Huge tank car fleet, many plants and vast underground storage assure adequate supplies.

ANCHOR PETROLEUM COMPANY

TULSA — CHerry 2-7261

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FULL AND HALF CABS

Full Cab and Model 151J King Winch Illustrated

★ Protection
★ Comfort
★ Safety
★ Convenience

Roll-down windows, full opening . . . full panel-board head lining and masonite door lining . . . safety glass throughout . . . all-steel welded construction . . . door locks.

KING WINCHES

King Winch on R-140 and R-160 International

There's a front-mount King Winch designed to fit your specific needs . . . for ½-ton through 2½-ton trucks . . . pulling capacities of 8,000 to 19,000 lbs.

P.T.O.-driven King Winch on Willys Jeep

FOR ALL WILLYS JEEPS, 4 WD TRUCKS AND 4 WD STATION WAGONS.

Power-take-off-driven King Winch models 130J and 131J for CJ-3B and older-model Jeeps, can be transferred to CJ-5 and CJ-6 Jeeps . . . nothing extra needed.

Koenig cabs and King Winches for Willys vehicles available through all Willys Motors, Inc., dealers and distributors in U.S.A. . . . and Willys-Overland Export Corp. distributors in other countries.

Koenig IRON WORKS, INC.

WEST 12th AND ELLA BLVD., HOUSTON 7, TEXAS

news • *Continued*

rado, Wyoming, Montana, Utah, New Mexico, eastern Nevada, southern Idaho, and western Texas. The company maintains offices in Salt Lake City and Butte.

Northwest Gas Equipment Inc., Seattle, has been appointed representative in the Pacific Northwest for Reynolds Gas Regulator Co., Anderson, Ind.

Eleven industrial gas contracts—calling for more than 8 MMcf of gas per day — have been signed by British Columbia Electric, Vancouver, B.C. for delivery in the Lower Mainland of the province. Biggest single contract, signed by B. C. Sugar & Refining Co., calls for maximum daily delivery of 300 MMcf.

Vermont, one of the last states without gas safety code regulations, will adopt state and local regulations for transmission and distribution lines. The matter came up when a petition was signed stating that the signers were not opposed to natural gas coming into the Bennington area, but they didn't want construction authority granted until a strong code had been adopted by the state.

Longenecker Associates, Pittsburgh, has been named representative for two major products of Koppers Co. Inc.'s Metal Products division. Aeroturn dust filters and mechanical dust collectors will be handled by Longenecker in eastern Ohio, northern West Virginia and western Pennsylvania.

Louisville Ky. Gas & Electric added 5150 new gas customers to its lines in the first eight months of 1956 compared to only 2496 in the first eight months of 1955. An additional 20 MMcf/day to its network which started Nov. 1 will permit a further boost in new installations.

San Pedro Natural Gas Service Co., serving approximately 300 customers in the towns of St. David and McNeal, Ariz., has been purchased by Arizona Public Service Co., Phoenix, Arizona Public's president, Walter Lucking, said his company will spend $100,000 to extend gas service to the nearby Elfrida area for some 150 residental, commercial, and irrigation customers.

GAS

associations

"Automatic all the way" theme of AGA campaign

Jan. 1, 1959 will be a historical date in the gas industry and will mark another milestone of progress in the industry. After this date all domestic gas ranges must include automatic lighting for *all* burners (oven and broiler as well as top burners) to qualify for the AGA Blue Star Seal of Approval.

A campaign portfolio, "Automatic All the Way," is now in the hands of all member utilities and domestic range manufacturers. The kit offers means for all to stimulate customer interest in and to dramatize the automatic features and modernity of gas ranges. Because more than 90 per cent of all ranges are sold by dealers, the aim is to upgrade and stimulate dealer sales.

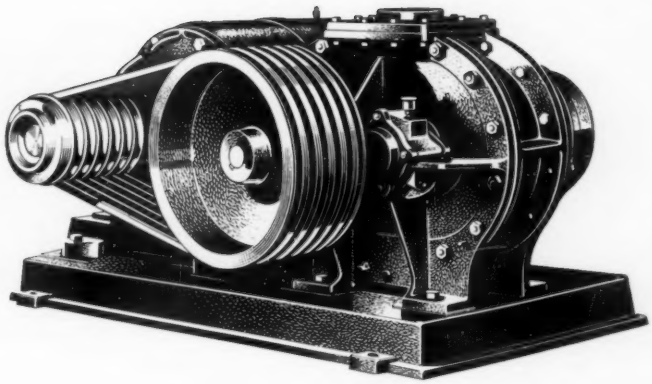
AGA co-sponsoring new 90-minute drama series

In its first use of network television as an advertising medium, the American Gas Association has signed to sponsor, on alternate weeks, a half hour of CBS Television's 90-minute dramatic series, "Playhouse 90."

The AGA will sponsor the 10:30-11:00 pm EST portion of Playhouse 90 on alternate Thursdays, effective Jan. 10.

Playhouse 90 is the first hour and a half drama series to be presented by a television network on a regular weekly basis.

Marjorie T. Chandler, home service director of Consumers' Gas Co., Toronto, Canada, has been named chairman of the AGA home service committee. Committee projects for 1957 include the annual AGA Home Service Workshop, Feb. 4-6 at Toronto, with Consumers Gas as host, and revision of the home service training booklet, "Home Calls."



R-C gas pumps eliminate friction and leakage problems

One of the many operating advantages of Roots-Connersville rotary positive displacement gas pumps are the exceedingly small losses due to leakage and friction. This high efficiency is assured by the inherent design of the pump in which the impellers operate without internal contact. Yet so accurately gauged are the clearances that slippage is reduced to an absolute minimum. Maximum power savings are realized since horsepower required is determined by operating pressure.

From 5 to 50,000 cfm, these pumps assure positive control of both volume and pressure. Design simplicity further assures long term peak performance with little down-time and maintenance held to a minimum.

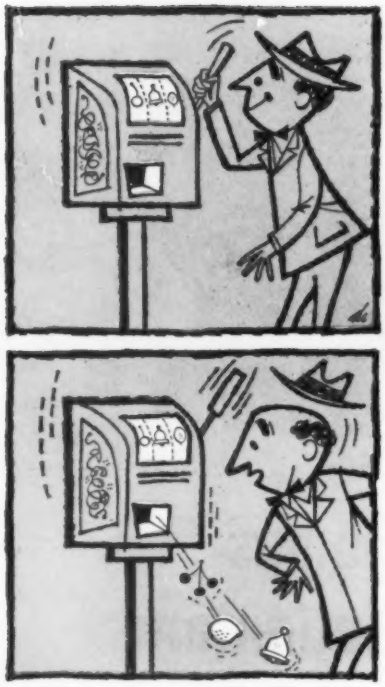
Available in 76 capacities and sizes, R-C rotary gas pumps can be exactly matched to your requirements. For engineering data, write for Bulletin 32-33-B-13 or Bulletin 31-B-17 on small pumps.

Engineers—unusual career opportunities await you at Roots-Connersville. Address your resume to Professional Employment Manager.

ROOTS-CONNERSVILLE BLOWER

A DIVISION OF DRESSER INDUSTRIES, INC.

157 Oregon Ave., Connersville, Indiana. In Canada—629 Adelaide St., W., Toronto, Ont.



What's inside makes a big difference!

Your meter can be a "lemon" too if inaccuracy of the Diaphragm robs you of revenue.

Accurate, supersensitive diaphragm action is assured when you specify Vulcan Synthetic Diaphragms.

Specify Vulcan . . . and be sure

Another REEVES VULCAN RUBBER PRODUCT

REEVES BROTHERS INC.

Vulcan Rubber Products Division
54 Worth Street, N. Y. 13, N. Y.

Gas Meter Diaphragms
Diaphragms for Regulators & Controls

GAS people

Harry Hancock
Cities Service

Kirby Crenshaw
Cities Service

HARRY D. HANCOCK has been elected president of Cities Service Gas Co., Oklahoma City, succeeding GLENN W. CLARK, who has become president of Mississippi River Fuel Corp. KIRBY E. CRENSHAW has been elected to the new post of executive vice president of Cities service. Mr. Hancock has been manager of the natural gas department of Cities Service Petroleum Inc.

East Ohio Gas Co., Cleveland, has named LESTER G. BRAILEY personnel director, succeeding DANIEL E. MALONEY, who has retired after 39 years with the company.

Michigan Consolidated Gas Co., Detroit, has established a new organization for its northern districts with headquarters in Mt. Pleasant. FRANCIS M. RUDMAN, as general manager, will have overall supervision of operations in Big Rapids, Cadillac, Greenville, Belding, Lundington, Traverse City, Mt. Pleasant and a number of other nearby communities. WILLIAM J. MARION was named sales manager of the northern districts and RENO MACCARDINI was appointed engineer.

District sales offices in Dallas, Houston, and San Diego, Calif., have been opened by Consolidated Electrodynamics Corp., Pasadena, Calif. Newly appointed managers are CLIFFORD W. BISHOP, Dallas; MAYNARD V. PERRY, Houston, and ROBERT H. KITSON, San Diego.

B. E. HARRELL has been named manager of the newly created gas supply and sales department of Arkansas Louisiana Gas Co., Shreveport. He has served in the pipeline, compressor station, production and industrial sales development departments of the company.

ALBERT T. HEMP JR. is gas measurement accounting head of New York State Natural Gas Corp., Pittsburgh.

Lone Star Gas Co., Dallas, has appointed NEAL STEPHENSON as manager of customer service for the Dallas division of distribution. The company has also named ROBERT PETERSON JR. as publicity representative.

THOMAS Z. DUNN has been promoted to manager of commercial sales for Ohio Fuel Gas Co., Columbus.

CHARLES K. KAISER is a new agent for Pennsalt Chemicals' line of corrosion-resistant products in eastern and upper Michigan.

H. N. MALLON has been named to the newly created position of chairman of the board of Dresser Industries Inc., Dallas, and will remain as chief executive officer. J. B. O'CONNOR, formerly executive vice president, succeeds Mr. Mallon as president. Other executive changes at Dresser include HECTOR P. BONCHER, operating vice president, who will be in charge of the heavy machinery divisions, supervising operations of Clark Bros., Dresser Manufacturing di-

Lester Brailey
East Ohio

F. M. Rudman
Mich Con

William Marion
Mich Con

R. Maccardini
Mich Con

H. N. Mallon
Dresser

J. B. O'Connor
Dresser

vision, Roots-Connersville Blower division, Pacific Pumps Inc., and Dresser Ideco Co. HENRY HERZIG is now operating vice president in charge of Lane-Wells Co.; OTTO HAMMER is operating vice president in charge of Guiberson Corp. and Security Engineering Co.; and ROBERT H. MCLEMORE is vice president and general manager of the Turbodrill division. New members of the board of directors are GORDON G. GUIBERSON, president of the company bearing his name, and R. E. REIMER, who is vice president, secretary and treasurer of Dresser Industries.

The dividing of its eastern sales region into two sales districts has resulted in the following Oronite Chemical Co. appointments: E. J. VAN BUSKIRK, manager of the northeastern district with headquarters in New York, will handle sales in New York, northern New Jersey, New England, and eastern Canada. B. W. COLAIANNA, managing the southeastern district from Wilmington, Del., will cover southern New Jersey, eastern Pennsylvania and the South. J. H. SELBY is manager — special accounts, eastern sales region.

A. C. HANSEN is now national service director of Robertshaw-Fulton Controls Co. He has been head of inspection and quality control at the company's Grayson Controls division, and will continue in this capacity, making his headquarters in Long Beach, Calif.

ROBERT M. BRIGHAM, who was named assistant vice president early in 1956, has been elected a vice president of Springfield (Mass.) Gas Light Co. Mr. Brigham celebrates his 25th year with the company this year.

White-Rodgers Co., St. Louis, has appointed HOWARD A. TEASLEY to a newly created sales department

FAST

is the word for these efficient little

RIDGID

Drop-Head Dies!

Easy threading of ⅛" to 2" pipe or conduit

Snap size head you want into ratchet drive ring, from either side—it can't fall out. Dies reverse easily for close-to-wall threading. 00R and OR, ⅛" to 1"; 111R and 11R, ⅛" to 1¼"; 12R, ⅛" to 2". Free carrier with sets. Conduit and special dies available. Real work-savers—at your Supply House!

RIDGID *Bolt Threaders, too — No. 00R-B, ¼" to 1", National Coarse or fine thread, efficient drop-head dies.*

"Threaded Pipe — It's Tight — It's Best — Costs Less"

RIDGID

Work-Saver Pipe Tools

The Ridge Tool Company, Elyria, Ohio, U. S. A.

Telsco Fittings get, and hold, a sure grip

TELSCO FITTINGS DIVISION

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WARRENGAS
the Concentrated fuel

WARREN
PETROLEUM CORPORATION
LIQUEFIED PETROLEUM GAS DIVISION
TULSA, OKLAHOMA

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SALES OFFICES:
FORT WORTH, TEXAS
HOUSTON, TEXAS
LOUISVILLE, KENTUCKY
MADISON, WISCONSIN
MIDLAND, TEXAS
JACKSON, MISSISSIPPI
ST. LOUIS, MISSOURI
NEW YORK, NEW YORK
OMAHA, NEBRASKA
COLUMBIA, SOUTH CAROLINA
TAMPA, FLORIDA
SAN FRANCISCO, CALIFORNIA

Be Completely Insured!
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NEW ENGLAND FORESTRY SERVICE

the complete Gas Leak Location and Mitigation Survey Program

Vegetation Surveys*
Building Inspection Surveys
Commercial and Industrial Surveys

EDSON F. WHITE, *Operating Manager*
Special Representative
J. E. B. GIBBONS
44 ABBOTT ROAD, BRADFORD, PA.

Write, wire or phone COLLECT to
NEW ENGLAND FORESTRY SERVICE, INC.
281 MAIN STREET, READING, MASS.
Tel. REading 2-2525

*Originator of Vegetation Surveys for Gas Companies in 1934

people • *Continued*

position carrying the title of national sales application engineer. He will aid furnace manufacturers on AGA testing requirement problems.

Philadelphia (Pa.) Electric Co. has named ALLAN G. MITCHELL as comptroller. Most recently he served as statistician.

ARTHUR J. CONNELL is a newly elected vice president of Stone & Webster Engineering Corp., New York.

Three new directors have been elected by Laclede Gas Co., St. Louis. They are LLOYD A. HORTON, treasurer; DAVID L. GARDNER, secretary; and LEE M. LIBERMAN, assistant vice president for operations.

W. R. STEPHENS has become chairman of the board of the Arkansas Louisiana Gas Co.

J. H. Holan Corp., Cleveland, has made several sales appointments. ROBERT R. RECTOR, formerly with McCabe-Powers Auto Body Co., is vice president in charge of sales. ARTHUR C. FRANK, formerly sales manager for Holan Corp. of Georgia in Griffin, Ga., returns to Cleveland as assistant sales manager. WALTER G. ROBERSON is serving Holan customers in Georgia, Tennessee, and Arkansas, and JAMES JOHNSON is working in Florida, Alabama, and Mississippi.

CARL R. LAWRENCE, general superintendent of the Atlanta operating department of the Atlanta (Ga.) Gas Light Co., has been elected vice president of the company.

JOHN E. SPEARS, vice president in the gas and coke division of Koppers Co. Inc., Pittsburgh, has been elected vice president and general

Robert Rector
Holan Corp.

Arthur Frank
Holan Corp.

Carl Lawrence
Atlanta Gas

Fred Batten
Columbia

manager of that division. He will direct all activities of the division, which operates plants at Kearny, N. J., and St. Paul, Minn. He has also been appointed regional representative, eastern district of the entire company.

FRED W. BATTEN has been named vice president of the Columbia Gas System Service Corp. He will move to New York from Pittsburgh where he has been vice president and general manager of Columbia's Pittsburgh group. Promotions in the Service Corp. include: BERNARD J. CLARKE to chief supervisory engineer in New York and WILLIAM C. DAY to manager of the gas engineering department, headquartering in Columbus, Ohio.

J. R. DUNGAN JR. has been named assistant superintendent of gasoline plants for Lone Star Gas Co. and Lone Star Producing Co., Dallas. M. M. MARTIN has been promoted to process engineer; J. A. BATES is departmental superintendent of the gasoline plant; W. A. ROBINSON is west Texas district superintendent supervising operations of gasoline plants.

JAMES A. WIGGS has been named sales representative at Phoenix for Kaiser Steel Corp.

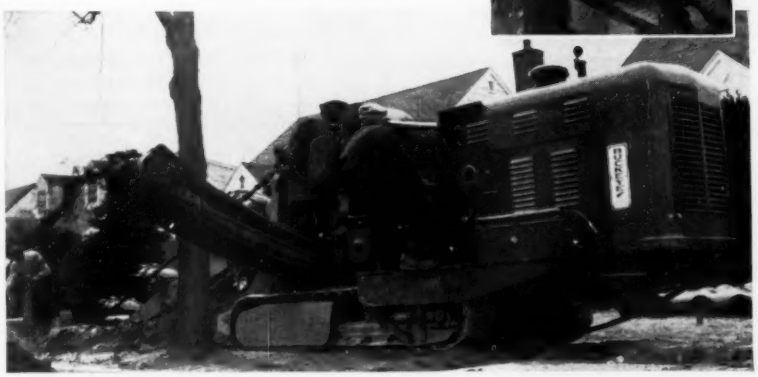
LYMAN K. STUART treasurer of C. H. STUART & Co. Inc., Newark, N. Y., has been elected a member

W. G. Roberson
Holan Corp.

James Johnson
Holan Corp.

Push-Button Conveyor Shift Speeds Ditching with the 407

To clear obstructions, just push a button... conveyor shifts while you keep digging!



Instant conveyor shifting by push-button control is a big Gar Wood-Buckeye Model 407 advantage for utility work. It means faster, easier nonstop work in close quarters and around obstructions. Only Gar Wood-Buckeye has it!

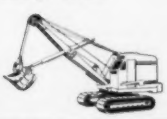
And, only Gar Wood-Buckeye gives you these other important operating advantages: Speeds you can find and use . . . one selector lever plus high-low range lever makes changing speeds easy. Independent lever steering that is positive and reliable. Instant control of live hydraulic boom with positive down-pressure.

In every way, the 407 is far easier to operate, control and adjust than any other ditcher in its class. No wonder it has become the standard for utility work, as well as the world's largest selling ladder-type ditcher! See your Gar Wood-Buckeye dealer, or write direct to: Customer Service Department, Gar Wood Industries, Inc., Wayne, Michigan.

GAR WOOD INDUSTRIES, INC.
Wayne, Michigan, • Findlay, Ohio

Gar Wood Buckeye

Gar Wood Load-Packers

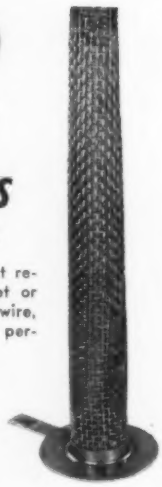


Gar Wood Excavators

Gar Wood-St. Paul Hoists & Bodies

SANDUSKY
MAC-IRON
OHIO
ESTABLISHED 1901

IN-LINE STRAINERS TO ORDER



Strainers to your exact requirements . . . basket or conical . . . woven wire, single and duplex, or perforated plate.

All types available in carbon steel, Monel, and stainless.

Specialists to the Petro-Chemical Engineering and associated fields, the Mac-Iron operation is based on scope, quality, and service. Also manufacturers of stock and specification blinds, spacer rings, permanent and temporary strainers, filters, and pivot flanges.

Write today for complete information and literature.

The Mack Iron Works Company
Warren and Water Sts. - Sandusky, Ohio

Outsells . . . Outlasts . . . Outperforms . . . ALL OTHERS!

NEW **AQUA** Water or gas **VALVE BOX LOCATOR**

$29.50 F.O.B. Cin., Ohio
Your Name In Gold FREE!

One on EVERY SERVICE CAR!

- **NATION'S MOST WIDELY USED LOCATOR!**
- **NO WIRES, BATTERIES or SWITCHES** simple, powerful magnetic action, factory adjusted for YOUR geographical location.
- **NO NEEDLE SPINNING**—exclusive electric braking action.
- **TOP VIEW READING**—No stooping.
- **RUGGED, COMPACT, ACCURATE, CONVENIENT!**
- **GUARANTEED**—to function regardless of surface or ground cover.
- **15-DAY FREE TRIAL**—No money! No obligation! You be the judge!

ORDER NOW—Wire or Call Collect for fastest delivery! PHONE: Kirby 1-4200

AQUA SURVEY & INSTRUMENT CO.
2016 Leslie Ave., Cincinnati 12, Ohio

people • *Continued*

of the board of directors of the New York State Electric & Gas Corp., Ithaca.

WILLIAM R. STEVENS has been named to the newly created post of vice president in charge of operations for the Berkshire Gas Co., Pittsfield, Mass.

OFFICE EQUIPMENT AVAILABLE

Because of a change in procedure, a utility is now offering for sale miscellaneous cabinets and office equipment used for customer billing and several each of the following:

Addressographs
Type 3400
Type 1955
Type 1900
Type 3700

Please address inquiries to M. G. Sullivan,
Niagara Mohawk Power Corporation
Syracuse 2, New York

BILLING EQUIPMENT
FOR SALE

2 Model 30-1700—Burroughs Billing Machine—1945 ..... $1,000.00 each
1 Model 30-1700—Burroughs Billing Machine—1949 ..... 2,000.00
1 Model 1700—Addressograph—1943 ..... 350.00
1 Model 3700 — Addressograph Post Card Printer and Addresser—1950 ..... 6,000.00
2 Model SB-133—Addressograph Steel Cabinet with drawers.. 150.00 each

Prices F.O.B. Waukegan, Illinois

North Shore Gas Company
209 MADISON STREET
WAUKEGAN, ILLINOIS
c/o Harry F. Luther

Adams repair and broken-pipe clamps
Aqua dipping needles
Bar hole drills carbide tipped
Devcon plastic steel
Electronic meter proving equipment and quick connecting tables
Fleet-Line pipeline vents
Gas-Phuse gas shut-off
Industrial vacuum cleaners
M-Pacto tools
Meter domes
Perma-Seal bell clamps
Term-X Couplings
Trantex Tapes
Tube Tules
Vinyl industrial coating
Walworth lubricated valves

EASTERN STATES SUPPLY CORPORATION
11 West 42nd St., New York 36, N. Y.
LOngacre 3-2717

DEATHS

GEORGE S. HAWLEY, 85, chairman of the board of the Bridgeport (Conn.) Gas Light Co. died recently in the Bridgeport hospital.

WILLIAM B. SMITH, sales representative for American Meter Co., died recently at his home in Owensboro, Ky. Mr. Smith had worked in the gas industry since 1911, beginning his career with Manufacturers Light & Heat Co. in Pittsburgh. He joined American Meter in 1928 as a salesman for the Westcott & Greis division in Tulsa. In 1930 he was appointed sales representative in West Virginia and Kentucky, a post he held until his death.

CRAIG ESPY

CRAIG ESPY, Tulsa district manager of the Chilton Co., passed away suddenly in Dallas on Dec. 7. While in that city on a business trip, Mr. Espy suffered a fatal heart attack.

Mr. Espy became affiliated with *Western Gas*, GAS' predecessor, in 1927 shortly after he was graduated from the University of Redlands in Redlands, Calif.

Except for a few years with the *Oil & Gas Journal*, Craig Espy's career was with GAS and affiliated magazines. He will be sorely missed by his many friends in all phases of the gas industry.

Craig Espy is shown here (right) on one of his last trips in the field.

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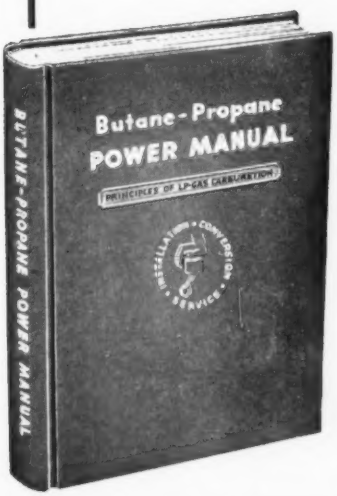

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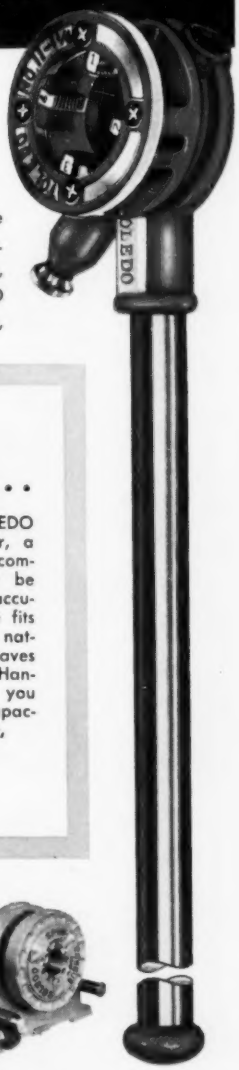

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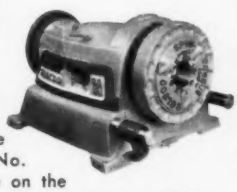

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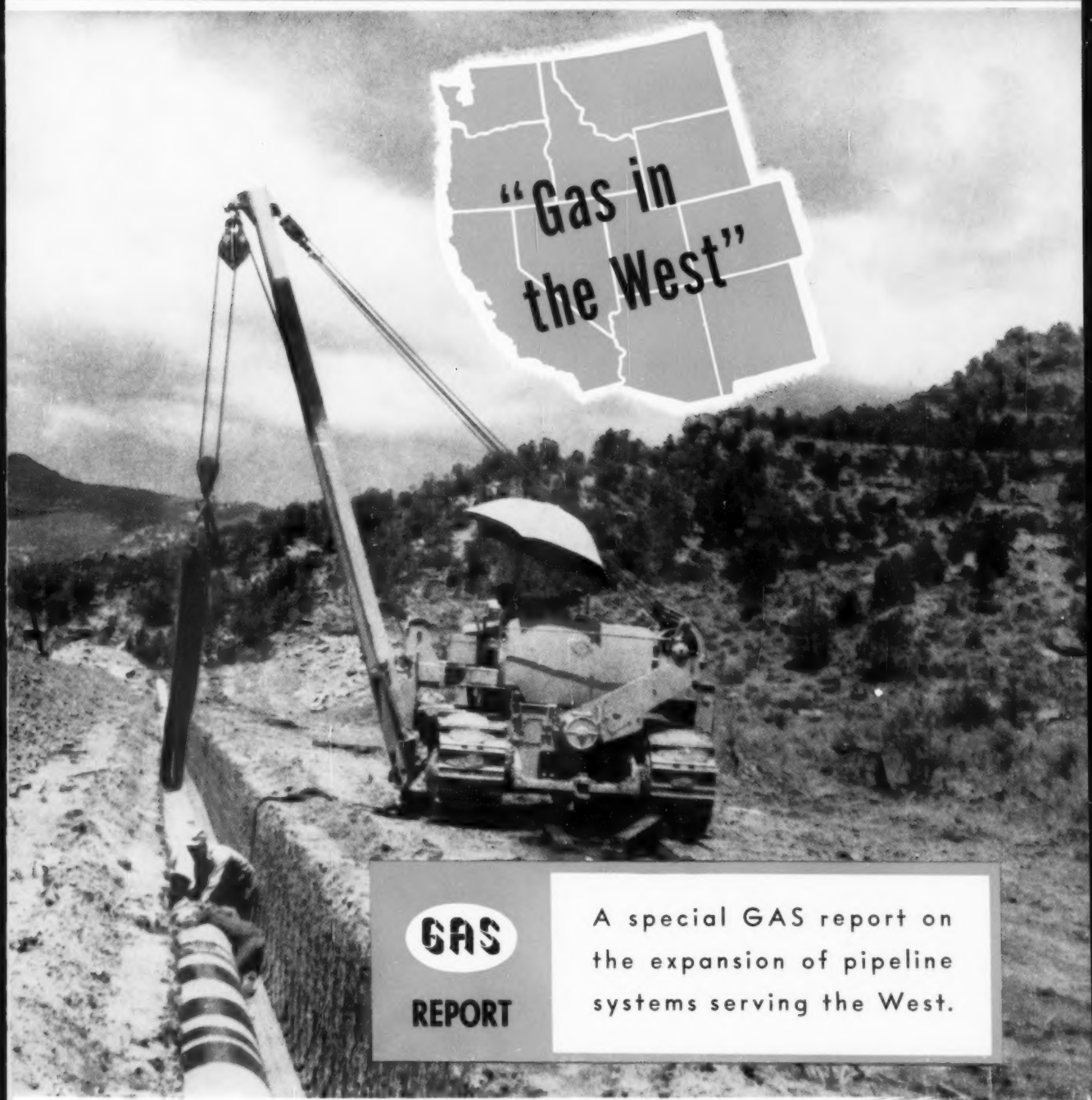

GAS REPORT

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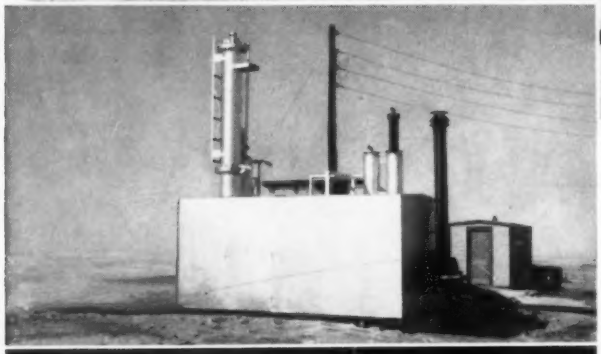
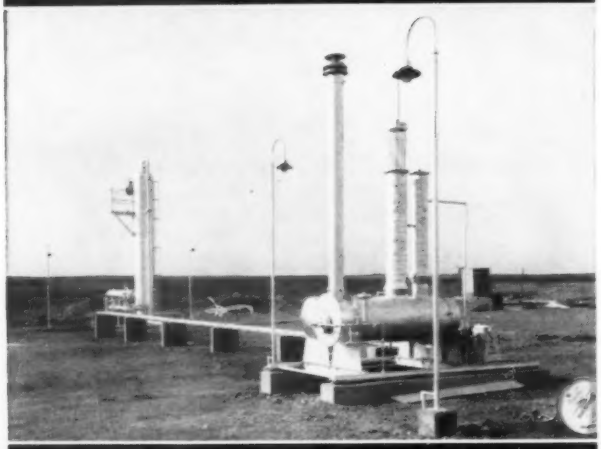


National 500 mcf/day, 125 # WP Glycol Dehydrator — N. Dakota



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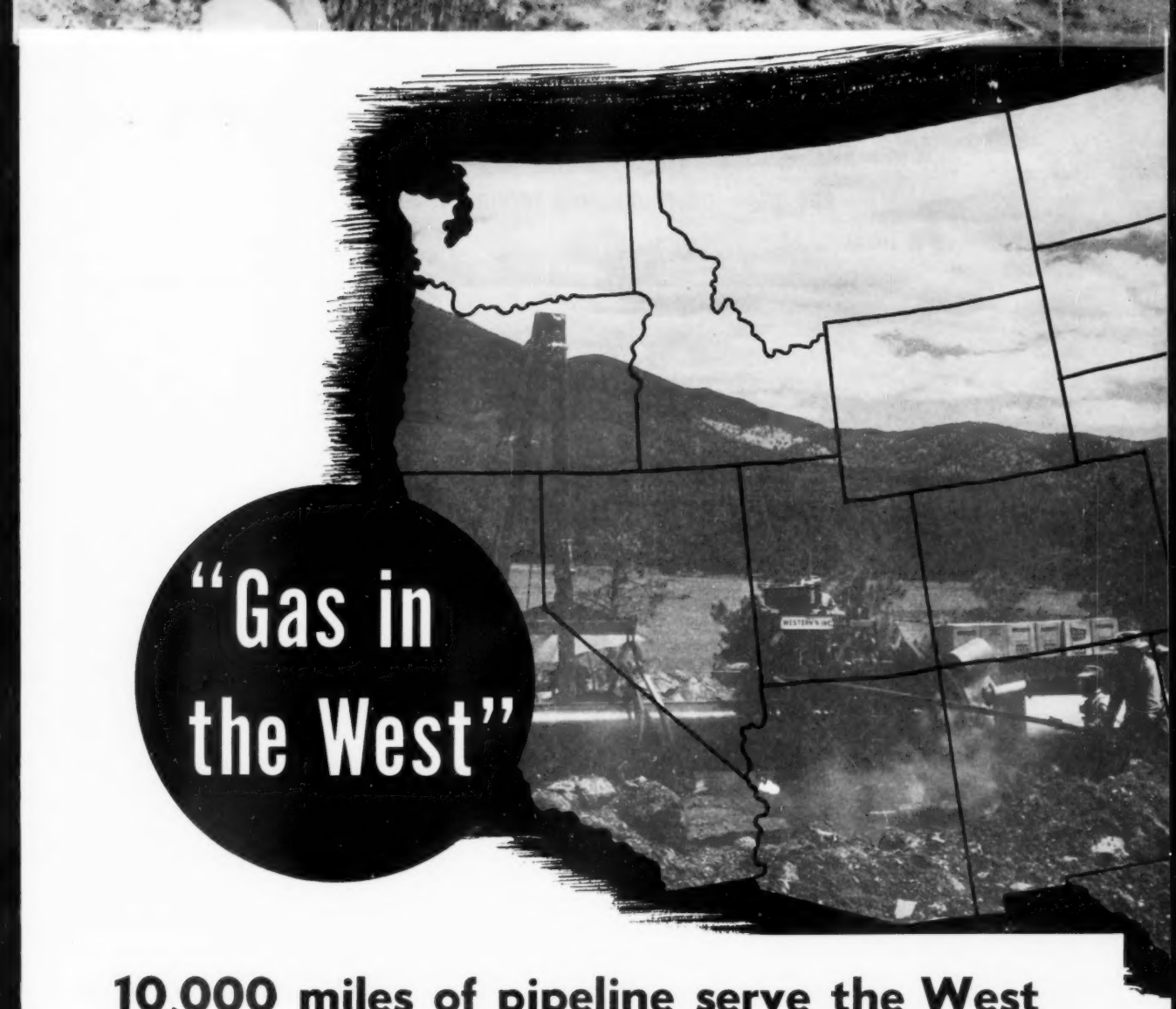


"Gas in the West"

10,000 miles of pipeline serve the West

SUPPLIES of natural gas flow into the 11 western states through some 10,000 miles of high-pressure transmission lines of major transmission and production companies. The majority of natural gas used in the west comes from the highly productive gas producing fields of the Permian and San Juan basins.

These sources will be augmented this year by supplies of natural gas from Canada's Peace River fields when the Westcoast Transmission Co. line is completed and begins selling to the Pacific Northwest Pipeline Corp. at the U. S.-Canadian border in Washington.

In addition to the far-flung transmission systems maintained by the three big transmission-production companies of the west (El Paso Natural, Pacific Northwest and Colorado Interstate), many distribution companies in the western states are also involved in transmission operations. These companies are in the transmission business more by necessity than by choice—the prime purpose of the transmission line is to bring natural gas to the company's distribution system. Some sell to other distribution companies along the line's route, others do not.

Since the first high-pressure gas transmission line was put into operation by El Paso Natural Gas Co. more than a quarter century ago, the gas transmission industry in the west has been constantly on the move. Today every metropolitan area in the 11 western states is served with natural gas or will have it before the year ends, and smaller suburban districts are constantly being added to systems.

The west is growing—growing faster than any other geographical region in the U. S. By 1960, the 11 western states will have a population of more than 24.7 million, an increase of 26 per cent since 1950. During this same period (1950-1960), the over-all population increase for the nation is expected to be barely 11 per cent.

To keep pace with this population growth, the gas industry must keep expanding. Planning new pipelines and increasing the capacity of existing ones is a job that can't be done in a day or two. It's a project that takes months, sometimes years, if stiff opposition is encountered in the FPC hearings.

The pipeline companies serving the West

El Paso Natural Gas Co.

The giant among western gas transmission companies is El Paso Natural. All of Arizona, and more than half of California and New Mexico depend upon this system for their daily supplies of natural gas.

BIGGEST supplier of natural gas in the west is the El Paso (Texas) Natural Gas Co. Totally dependent upon El Paso for their supplies of gas are Arizona Public Service Co. (Phoenix); Tucson (Ariz.) Gas, Electric Light and Power Co.; Nevada Natural Gas Pipe Line Corp. (which in turn supplies Nevada Natural Gas Co., Las Vegas, and California-Pacific Utilities, Henderson); and Southern Natural Gas Co.'s distribution operations in Flagstaff, Ariz.

The west's three biggest distribution companies, Southern California and Southern Counties Gas companies, Los Angeles, and Pacific Gas & Electric Co., San Francisco, depend upon El Paso Natural for 60 per cent of their gas supplies. The remaining 40 per cent of their needs are obtained from California's dwindling production.

Last year El Paso Natural's system delivered approximately 630.5 billion cu ft of natural gas to customer companies in the western United States. The biggest bulk of this gas, some 564 billion cu ft, was delivered to California's big three, PG&E, SoCal and SoCounties.

Natural gas from El Paso's production fields in the Permian and San Juan basins winds its way westward through two separate pipeline networks, aptly labeled the "southern" and "northern" systems by the company. The northern line originates in west Texas, then jogs north and connects with the line from the San Juan basin near Gallup, N. M. From there, the line heads westward to the California-Arizona border. At a point midway across the Colorado river, El Paso sells gas to Pacific Gas & Electric. When a current El Paso looping project is completed, the two southern California companies also will buy gas at this point, and transport it to Los Angeles through a transmission line they are now building.

El Paso's southern line runs from Texas' Permian basin through the barren desert wastes of New Mexico and Arizona to the California-Arizona border where it crosses the Colorado at Blythe. The two southern California companies

Map shows extensive system of El Paso Natural Gas Co.

buy it at the midway point of the river crossing, and Southern Counties transports it to the SoCal and SoCounties distribution areas.

According to population forecasts, California is destined to become the nation's most populated state by 1965. By 1960, it will rank a close second to New York. Increasing population means just one thing to gas companies—more demand for gas. Since El Paso Natural supplies most of the gas used in California, it means that the company must continually expand its facilities to meet the growing demand.

El Paso Natural is now finishing the largest expansion program in its history—a $195-million construction program that will soon provide an additional 450 MMcf/day to its customers.

Biggest part of the expansion program is designed to bring more gas to California consumers. El Paso is looping, with 34-in. pipe, 338 miles of its northern system.

Now pending before the FPC is another proposal to add 83.8 miles of 34-in. loop line to the same northern system. When this is actually added to the line, the northern system will be made up of three lines (24-, 30-, and 34-in.) from a point just south of Gallup, N. M., to the Arizona-California border, save for a stretch of a few miles in Arizona south of the Colorado river sales point.

This looping job, and installation of additional facilities in the production fields, will cost El Paso another $85 million. When completed, it will boost the number of miles in the company system to more than 7000.

Thirty-four inch pipe goes into the ground as crews work to complete looping project for El Paso Natural Gas Co. Loops will bring more gas to the California markets.

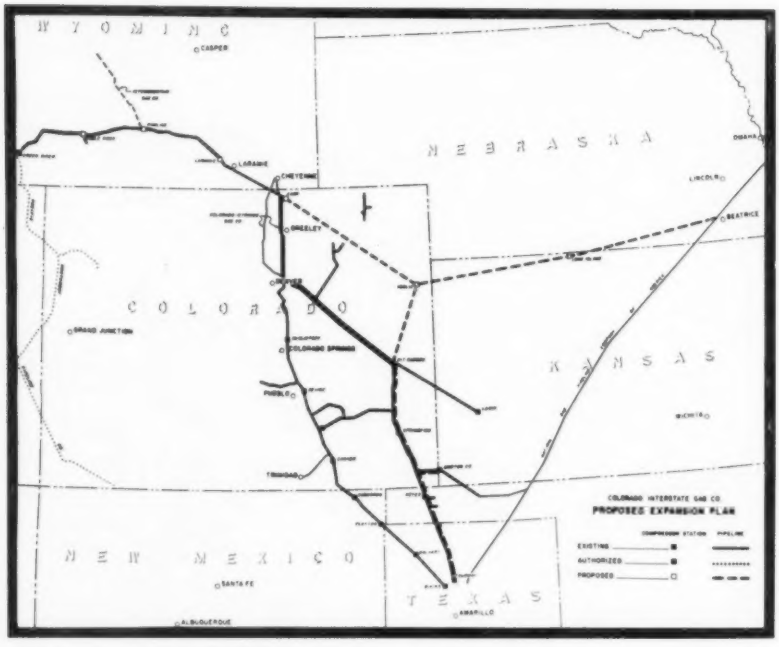
Colorado Interstate Gas Co.

Colorado Interstate is looking eastward toward Chicago as a site for increasing its annual gas sales. But, CIG is expanding its system now to meet the heavy demands in its own territory.

WHILE most gas companies in the 11 western states are expanding toward the Pacific Coast, Colorado Interstate Gas Co. is looking eastward toward the Chicago area market as its site for increasing gas sales.

Pending before the Federal Power Commission is a proposal to sell up to 450 MMcf/day to Natural Gas Pipe Line Corp. of America, a subsidiary of The Peoples Gas Light & Coke Co., Chicago. This proposal, if okayed by the FPC, will permit Colorado Interstate to sell natural gas from its own fields in Texas, Oklahoma, and Kansas, plus additional supplies purchased from Pacific Northwest Pipeline Corp., to NGPL for distribution in the thickly populated Chicago area.

This is the first time a so-called "western" transmission company has headed in any direction other than toward the Pacific Coast with its lines. This proposal, first advanced in April of last year, has become even more attractive to Colorado Interstate with the recent announcement of the Pacific Northwest-El Paso Natural Gas Co. merger. If the merger is approved



Colorado Interstate's transmission system.

by PNW stockholders, Colorado Interstate will find itself surrounded to the west, south and north by the El Paso system, leaving only the east open for expansion.

Colorado Interstate last year sold 227 billion cu ft of natural gas. Sixty per cent of this went to distribution company customers in Colorado, another 1 per cent went to Wyoming and New Mexico. The remaining 39 per cent was sold from the CIG production fields in Texas and Kansas to other transmission company customers, and was piped to midwest customers.

In 1960 Colorado Interstate expects to sell 379 billion cu ft. Included in this forecast of the future is 135 billion cu ft earmarked for Natural Gas Pipe Line.

Colorado Interstate's proposal to furnish gas for NGPL is now running through a rocky road in Washington. The proposal calls for the following new construction: building of a 345-mile 30-in. line from the company's present Kit Carson, Colo. compressor station to a tie-in point at Beatrice, Neb.; building a 215-mile, 26- to 34-in. loop from the Texas Panhandle production field to the Kit Carson station; and a 100-mile, 24-in. line from the Springfield station to the Pueblo station, both in Colorado. Four new compressor stations, with a total of 60,980 hp, also would be added to the system.

Total cost of the project is set at $87 million.

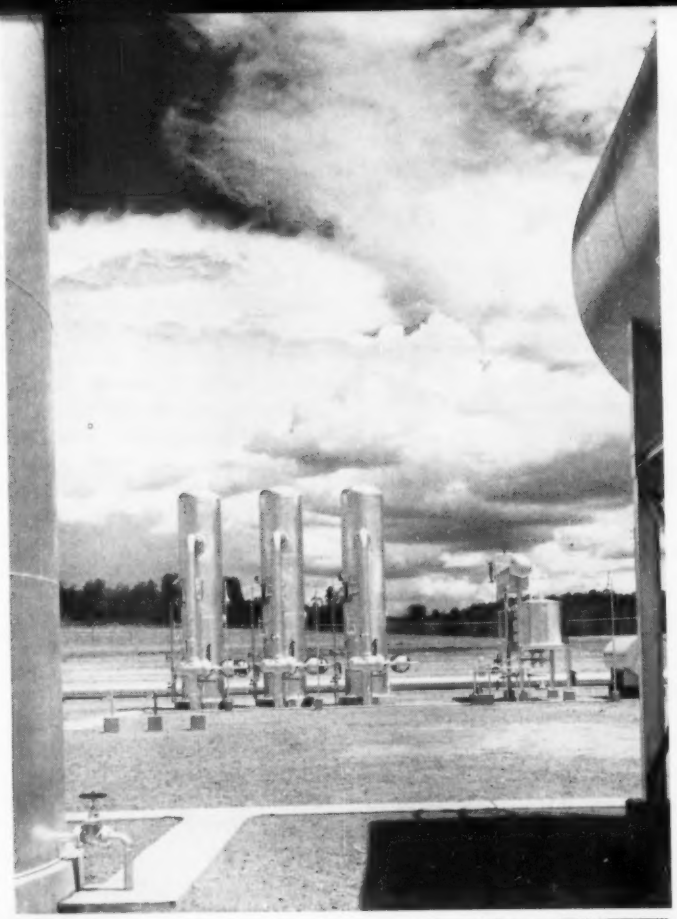
Another phase of Colorado Interstate's preparation for the future will become a reality in a few weeks when a 239-mile line running from the Pacific Northwest Pipeline tie-in at Green River to Laramie, Wyo., goes into service. This line will connect with an already built pipeline running to Denver. When the entire line is put into operation, it will deliver 200 (minimum) to 235 (maximum) MMcf/day to the CIG system, and provide additional supplies for distribution company customers in Cheyenne, Wyo., and Denver, Greeley and Pueblo, Colo.

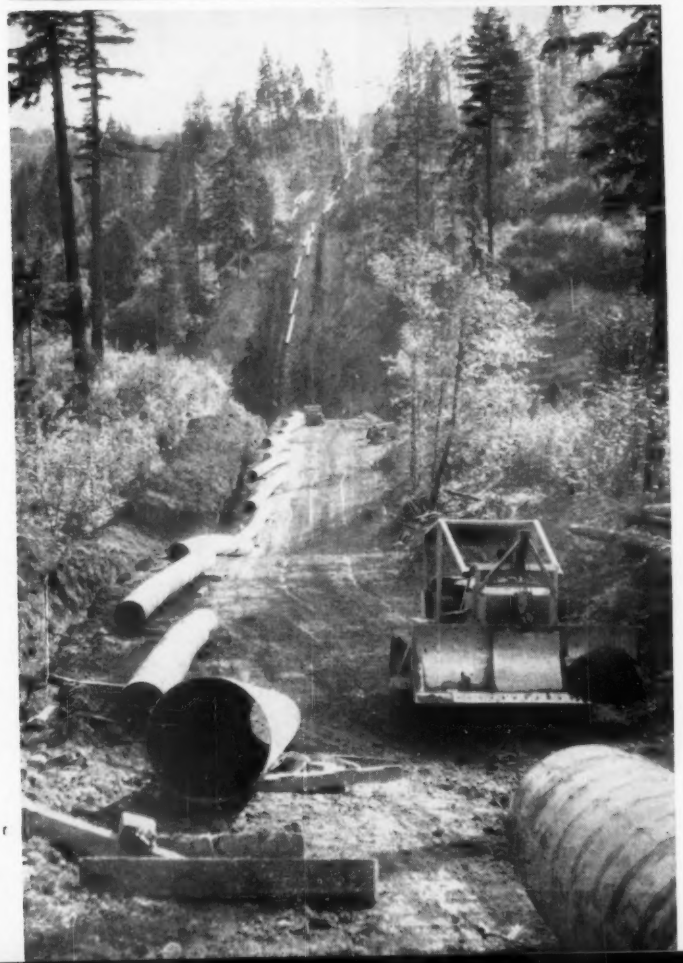
Some of this gas from Pacific is ultimately ticketed for re-sale to Natural Gas Pipe Line Co. if the FPC certificates the big Colorado Interstate expansion proposal.

Pacific Northwest Pipeline Corp.

LAST year the western states of Oregon, Washington and Idaho received their first supplies of natural gas from the 1487-mile Pacific Northwest Pipeline Corp. line that brought gas from the distant fields of the San Juan basin. Fourteen distribution companies, serving cities and towns in five Pacific northwest states, depend upon the "Scenic Inch" for their gas supplies. Many other cities will tie on to the system this year.

Pacific Northwest made pipeline history by building the 1487-mile line that runs from the desert of New Mexico through treacherous mountain country of Colorado, Wyoming and Utah to the Puget Sound area of Washington and on





"Gas in the West"

Dust scrubbers at Pacific Northwest's Station 1 in Colorado. This station will handle maximum volume of 300 MMcf/day.

to the Canadian border. Then, with the line barely completed, Pacific Northwest became involved in another bit of gas industry history-making. A few weeks ago Pacific Northwest's board of directors announced it had worked out an agreement to merge with El Paso Natural Gas Co. in a stock transfer deal. The proposal will be voted on this month by PNW stockholders. If it is approved, it will become the biggest transaction in gas industry annals by a healthy margin. Under the agreement, Pacific Northwest would operate as an El Paso Natural subsidiary.

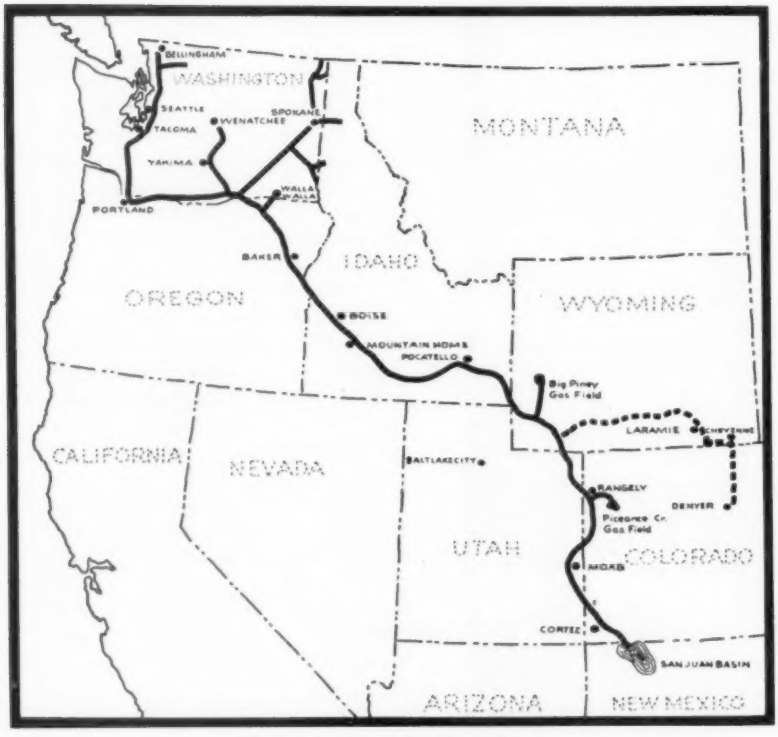
1957 will be Pacific Northwest's first full year of operation. In this period, the pipeline will supply 137 billion cu ft of natural gas for its customers. Of this total, 68 billion cu ft will go to distribution and transmission company customers for re-sale.

By 1960, the line's volume will more than double. PNW officials estimate that the total volume will reach 289 billion cu ft. Again, the bulk (nearly 149 billion) will go to distribution companies.

Two major pipeline systems will receive large supplies of gas from Pacific Northwest. At Green River, Wyo., both Colorado Interstate and Mountain Fuel Supply Co. will buy San Juan Basin gas. Colorado Interstate will receive 36.5 billion cu ft this year, then jump to 73 billion per year through 1961. Mountain Fuel Supply Co. has contracted to buy 18.2 billion cu ft yearly.

Another pipeline company is buying natural gas from Pacific Northwest. Westcoast Transmis-

Slopes, rock, timber and streams put men and machines to test during construction of Pacific Northwest line north from Portland to Washington markets.



Pacific Northwest Pipeline system.

sion Co. Ltd. will import 3.2 billion cu ft of San Juan Basin gas to serve Vancouver (B. C.) Electric Co. customers with natural gas until the Westcoast line from the Peace River field is completed.

Next year El Paso Natural will become a Pacific Northwest customer. In a complicated, three-way arrangement, El Paso will buy from PNW at Sumas, Wash., but will take delivery of the gas in the San Juan basin of New Mexico. Actually, El Paso has a contract to receive Westcoast Transmission gas at the Canadian border. In turn, El Paso is trading the Canadian gas to PNW in return for a like amount to be delivered in the San Juan basin. In 1958 16.6 billion cu ft will be traded in this manner. By 1960 the figure will jump to twice that amount.

As far as new construction is concerned, Pacific Northwest has just about completed its major program.

The PNW mainline is now in the ground. All that remains for construction crews is the installation of 186.6 miles of lateral lines ranging in size from 10-in. to 4-in. These lines will link Olympia and Metaline Falls, Wash., and Coeur d'Alene and Moscow, Idaho, with the mainline. An 8000-hp compressor station will be built at Sumas, Wash.

Pacific Gas & Electric Co.

PACIFIC Gas & Electric Co. began transporting imported "Texas" natural gas through its Super Inch line from the California-Arizona border at Topock to the Bay Area and other distribution points in 1950. The 502-mile line brings gas supplied by El Paso Natural Gas Co. to the west coast.

To meet the demands of the ever-growing areas of central and northern California, PG&E is now in the midst of an expansion program that calls for a complete looping of the Super Inch by 1958.

When El Paso's current looping project through New Mexico and Arizona is completed, more supplies of gas will be available to PG&E. The San Francisco-headquartered utility is increasing its system to take advantage of this.

First stage of the Super Inch looping is now underway. Thirty-eight and a half miles of 34-in. loop has just been finished in the Bay Area, from Gilroy to Milpitas. Spreads are now working on a 25-mile stretch in the hills south of Gilroy, and on a 21.5-mile section from Topock west. A 1080-ft bridge spanning the Colorado river also is under construction at Topock. PG&E will buy gas from El Paso Natural at the mid-way point of the bridge. The new structure will parallel an existing bridge which went into use in 1950.

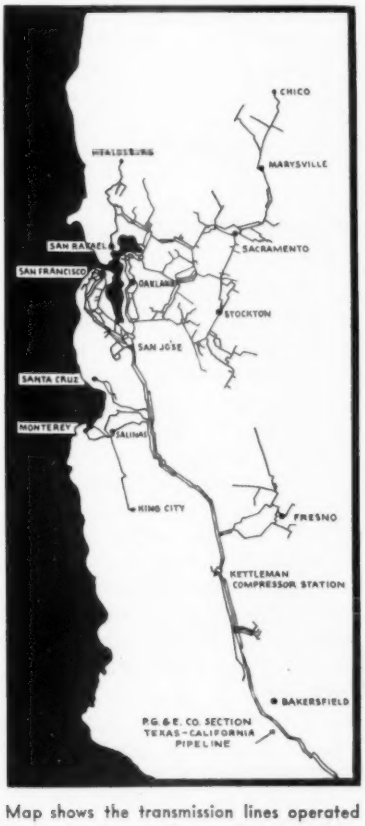
When the present construction is completed, the system's capacity will be increased from 700 MMcf/day to 750 MMcf/day. New con-

struction slated for this year will boost the capacity to 875 MMcf/day. When the entire line is looped in 1958, it will handle a daily delivery of 1025 MMcf.

PG&E also has announced plans to build a new 200-mile pipeline to supply natural gas in Humboldt county of northern California. This line will run from gas fields in the Sacramento valley.

More than 20 MMcf/day will be carried through the proposed new 12-in. line, nearly quadrupling the daily deliveries now available in Humboldt county. The line will take gas from the Beehive Bend, Perkins Lake and Corning fields in Glenn and Tehama counties, and transport it to Red Bluff, and extend across to Fortuna, Eureka and Arcata on the coast.

Construction of the line will cost $9.5 million, PG&E has announced. It will be built and put into operation this year.



Map shows the transmission lines operated by Pacific Gas & Electric Co. throughout California.

"Gas in the West"

Southern California Gas Co. Southern Counties Gas Co.

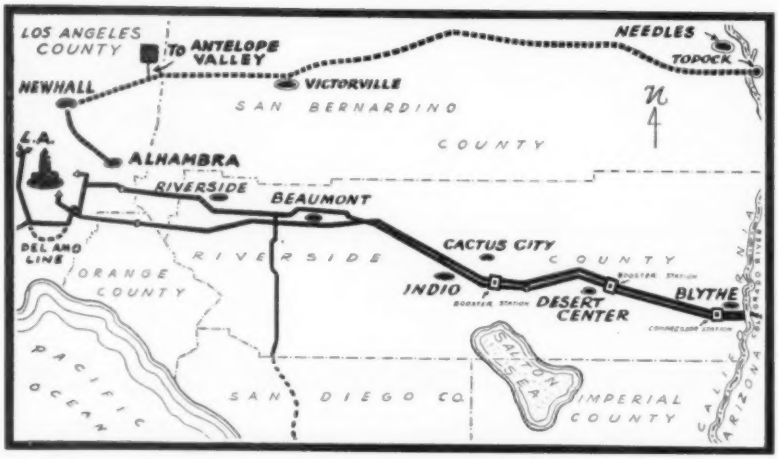
Construction crew lowers in section of 30-in. pipe on new SoCal-SoCounties line being built through residential section of suburban Los Angeles.

ALTHOUGH their distribution systems are operated separately, Pacific Lighting Corp.'s two subsidiaries, Southern California and Southern Counties Gas companies jointly operate transmission systems that bring supplies of Texas gas to the west coast.

SoCal and SoCounties jointly own the nearly-300-mile line which transports natural gas from the El Paso Natural system from the Colorado river sales point at Blythe, Calif. to Los Angeles. Southern Counties operates the line, and sells supplies of gas to San Diego Gas & Electric Co. en route to Los Angeles.

Now under construction is a 236-mile, 30-in. line from Newhall to Topock, Ariz. This line, jointly owned by SoCal and SoCounties, will connect with El Paso Natural's northern system at a sales point midway across the Colorado river. SoCal will operate the pipeline when it goes into operation.

When completed, the line will add an additional 177 MMcf/day to the two distribution companies'



systems. A new compressor station, housing four 1760-hp compressors, is being built at Topock as a part of the expansion.

Scheduled for completion in 1958, the project will cost more than $23 million.

The new line will connect with an already-built 49-mile stretch of 30-in. line running from Newhall to Alhambra in suburban Los Angeles.

Southern California and Southern Counties Gas companies jointly operate the line shown in solid black. Work is now in progress on pipeline shown in broken line.

Mountain Fuel Supply Company

MOUNTAIN Fuel Supply Co. is an integrated gas company by necessity. It has some 660 miles of transmission lines in operation, but the sole purpose is to transmit supplies of gas to the company's distribution systems throughout Utah.

Mountain Fuel produced more than 50 per cent of the gas it supplied through its distribution systems in 1955.

That ratio will go down considerably when a current construction program is completed this year. Mountain Fuel is building 38 miles of 20-in. line from Sweetwater, Wyo. to a tie-in point on its mainline to Salt Lake City to transport 60 MMcf/day of San Juan basin gas purchased from Pacific Northwest Pipeline Corp. To date, five miles of the line and 2640 hp in additions to existing compressor stations have been completed; 33 miles of line remains on the 1957 construction schedule.

Nevada Natural Gas Pipe Line Company

NEVADA Natural Gas Pipe Line Co. is unique among transmission companies in the west—it has no production facilities, it is strictly a pipeline carrying natural gas.

Nevada Natural's system consists of two parallel lines, each some 110 miles long, running from a connection with El Paso Natural's northern system at Topock, Ariz., across the Colorado river into California, then north into Las Vegas, Nev.

The second line has just been completed. A bridge crossing the Colorado near Topock should be finished within a few weeks, after being temporarily held up by a steel shortage.

Last year the pipeline handled 6 billion cu ft of gas, selling to distribution company customers in Las Vegas and Henderson, Nev. In 1960, the company expects to transmit 20 billion cu ft of gas.

Only expansion planned for the pipeline this year will be the construction of a 10-mile sales lateral to the U. S. Lime Products plant in Sloan, Nev. ■

For the report on the distribution companies in the West, turn to page 41.

Device detects presence of air in natural gas

GAS exclusive

United Gas Corp. has devised an air detector which does not depend on an external source of electric power for operation. It reacts rapidly to air detection, and is extremely economical. Here's how it operates . . .

By E. T. BUCKLEY, Research Department

United Gas Corp., Shreveport, La.

THERE are many very low pressure gas and oil fields where gas is produced at low pressures along with the oil. The low pressure in these fields necessitates the use of compressors to build up the pressure of the gas sufficiently for processing and injection into the transporting pipelines. If a leak or break occurs in the suction line of this system, air is admitted into the pipeline instead of gas being lost to the atmosphere. Because of the potential hazard of an explosive mixture of gas and air being produced, a close watch must be maintained on such lines and emergency protective equipment provided.

Several instruments are available which will monitor low pressure lines and close a motor valve in case of air contamination of the gas. One of these is the Btu meter or calorimeter. It is slow in operation. In the event of power failure this instrument reacts and shuts a valve in the pipeline even though there is no air contamination in the line. Such operation is definitely undesirable. The Btu meter costs about $1100. Another instrument, the specific gravity meter or gravitometer, is at a disadvantage because normal gravity changes may approximate values due to air contamination. Its cost is in the $1200 to $1500 range. Other instruments capable of detecting air in natural gas operate on the paramagnetic properties of oxygen or the detection of oxygen by the potential variations of a carbon electrolytic cell. All of the above instruments require regulated a-c power sources and are quite expensive when several installations are required. They all are troublesome when power failures occur. Our aim was to devise an air detector which would not depend upon an external source of electric power for operation, that would react rapidly to air contamination, and would cost much less than any comparable instrument.

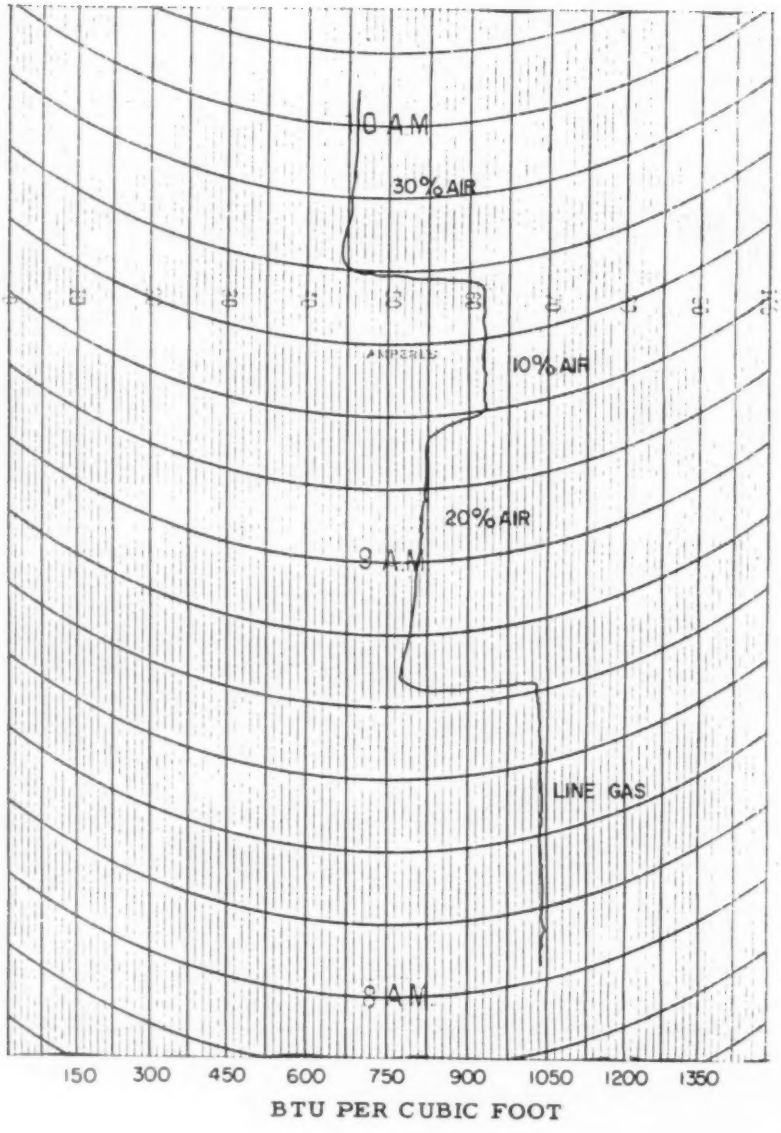


Fig. 1. Chart section showing effect of various air mixtures with line gas.

Air in natural gas lowers its heating value (Btu) in direct proportion to the amount of air contained *(See Fig. 1)*. It was decided to make use of this fact in the development of this device. A small stack or chimney was set in a vertical position with a bunsen burner supplying heat at the bottom. Temperature measurements of the flue gas were made while burning various air-gas mixtures. These measurements of direct temperature indicated the presence of air in samples well enough but resulted in long time lags. The response of a liquid filled thermal system was approximately 10 minutes *(Fig. 2)*. Using a thermocouple the response time was reduced to five minutes. Such time intervals are too long since the purpose of the air detector is to detect the presence of air in the line quickly and to operate the necessary valves in the pipeline to exclude further contamination.

To achieve this purpose, a thermopile of the type used on household furnaces was mounted inside the chimney. A thermopile produces electrical current because of the difference in temperature of the hot and cold junctions. The hot junctions of the thermopile mounted in the chimney receive most of their heat directly from the flame. The heat is conducted to the cold junctions by the metal of the chimney, a ceramic supporting ring, and hot gases flowing upward. When the heat from the flame is lowered, the hot junctions cool very quickly because the flame is their chief source of heat. The cold junctions tend to remain at about the same temperature for a few moments because of the heat retained by the metal chimney and the ceramic surrounding them. This very quickly reduces the difference in temperature between the two points and causes the output from the thermopile to approach zero. The resulting rapid change in thermopile output makes it unnecessary to await the total change of temperature at the two measuring points. The potential difference produced by the thermopile, when shown by a 0 - 50 millivoltmeter and suitable resistance, was found to indicate approximate Btu values on a 0 to 1500 scale (within about 5 per cent). A thermopile, mounted in a chimney made from aluminum of the proper thickness, became the primary device of the air detector.

The air detector uses electric current from three thermopiles in its operation. *Fig. 3* is a diagram of the complete electrical and pneumatic system, and *Figs. 4 and 5* show two photographs of the device. The thermopile mounted in the chimney gives an output reading on both the recorder and the millivoltmeter. This thermopile is referred to as the measurement thermopile since its output is almost directly proportional to the Btu of the gas supplied to the burner. The metal case which normally covers the measurement thermopile is removed so that as little heat as possible will be retained, thus making the thermopile more sensitive to changes of temperature produced by the measurement burner.

The control thermopile supplies the current to a solenoid which holds the flapper from the nozzle of a control valve in normal operation. This thermopile is surrounded

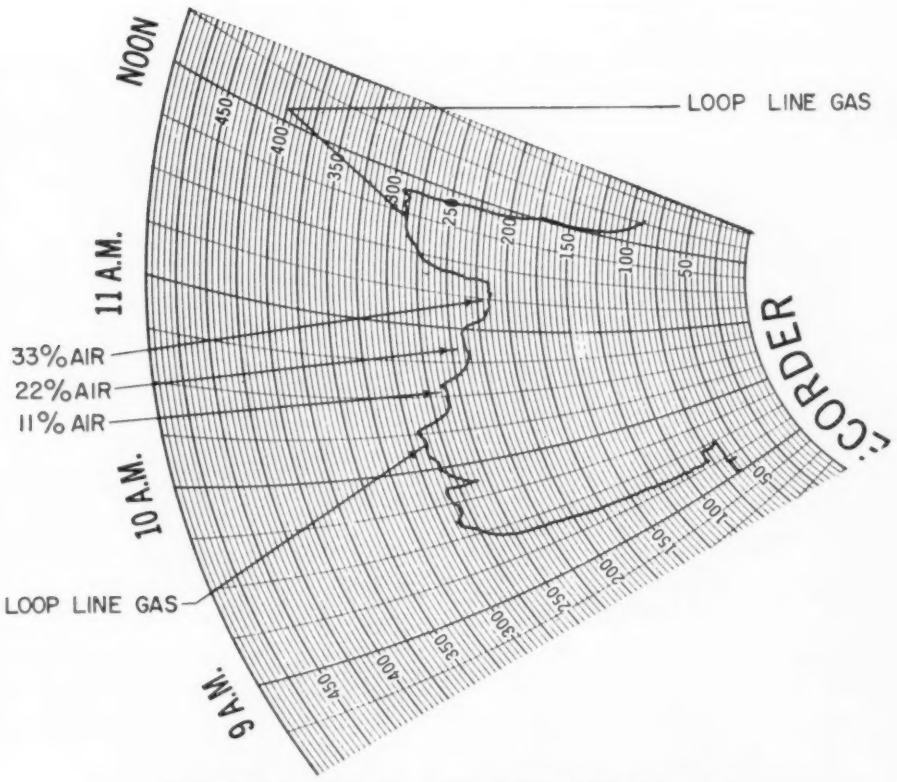


Fig. 2. Direct temperature measurement with liquid filled thermometer.

by a metal shield to protect it from strong drafts.

The current from the reverse current thermopile is supplied to the control valve solenoid when the contacts of the millivoltmeter-relay are together. This should occur only when the heating value of the gas is lowered by the presence of air to a predetermined value. Since the current from the reverse current thermopile is of opposite polarity to that of the control thermopile, it produces a counter magnetic force that causes the solenoid of the pilot control valve to release the flapper, allowing it to cover the nozzle when the contacts are made. The reverse-current thermopile also is mounted in the metal draft shield, slightly above the control thermopile.

Gas from the discharge side of the pipeline compressor is controlled at 20 to 25 psig by a reducing regulator so that it may be introduced into the instrument. In the instrument the gas passes through a built-in filter and a restriction of 45 in. of copper capillary tubing (.018-in. inside diameter) which further reduces the pressure to the proper value. It then travels through the pilot control valve and to the measurement burner. Gas which is not required to maintain about 0.25-in. W.C. pressure on the measurement burner is passed on and burned at the control burner to supply heat for the control thermopile and the reverse-current thermopile.

In the initial start-up of the air detector a by-pass with a toggle valve is utilized to light the control burner. A switch in the reverse-current thermopile circuit is left open ("light" position) until the meter reading is above the shut-off point. A reset button, when pressed at the proper time, helps the solenoid of the control valve to overcome the spring tension and to remove the flapper from the nozzle, thus allowing gas to flow through the control system.

The relay valve operates slightly differently from commercially available relay valves in that it is a non-bleed type and shuts off the operating medium to the motor valve when pressure is built up in its metal bellows. This type relay valve requires a packing gland. The shaft is as small as practical in order to reduce friction and leakage.

When a gas mixture with insufficient heating value to produce enough output from the measurement thermopile is burned, the indicator of the millivoltmeter approaches zero and is attracted to the magnetic contact of the millivoltmeter-relay. When the contacts are made they allow the current from the reverse current thermopile to oppose the current being supplied by the control thermopile to the solenoid of the pilot control valve. The solenoid then releases the flapper allowing it to cover the nozzle. While the nozzle of the control valve is uncovered, very little pressure is built up in the bellows of the relay valve because the opening at the nozzle is much larger than the opening through the capillary tubing. When the nozzle is covered,

Turn to page 100 for Fig. 4. Story continued on page 102.

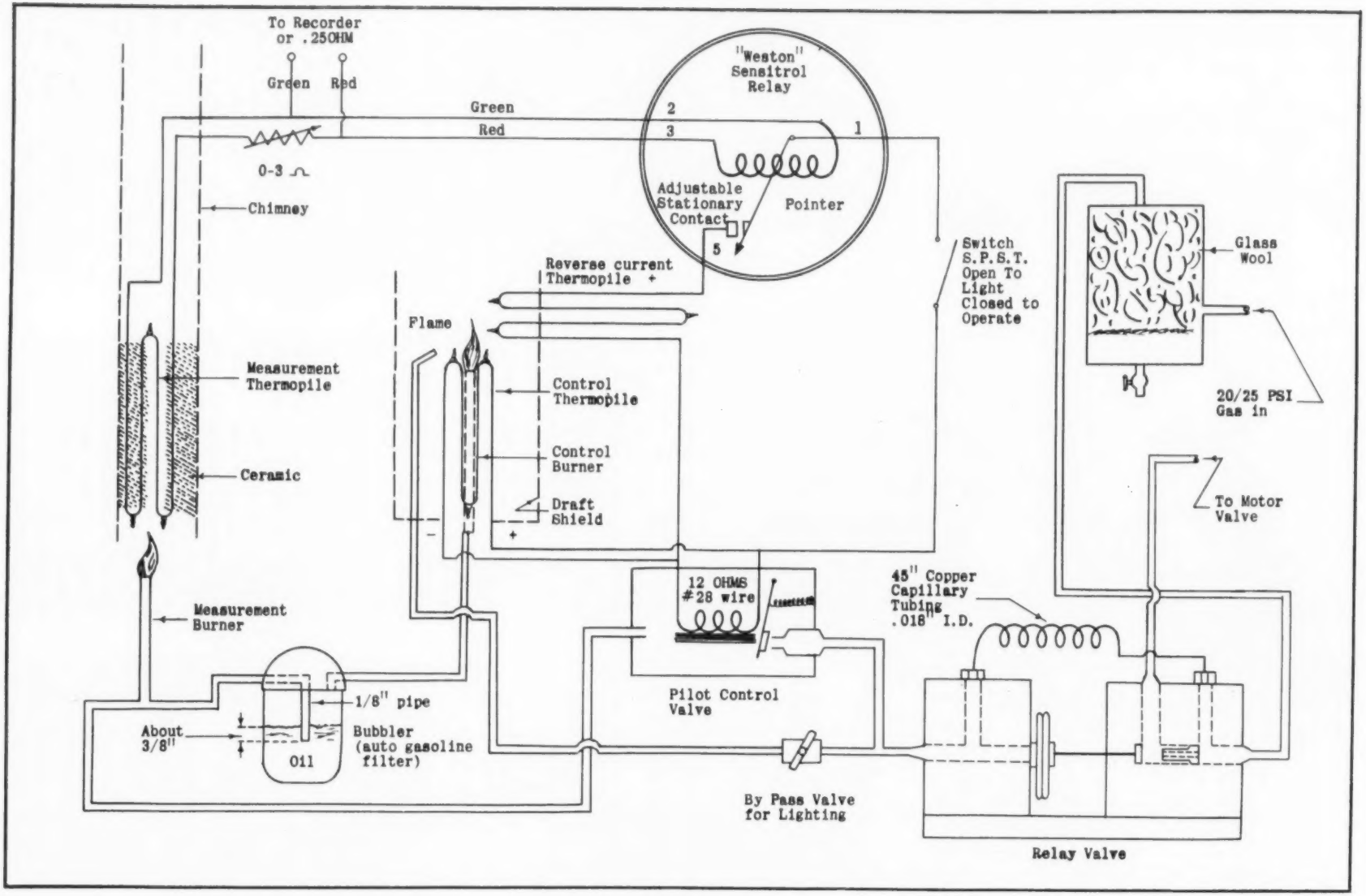
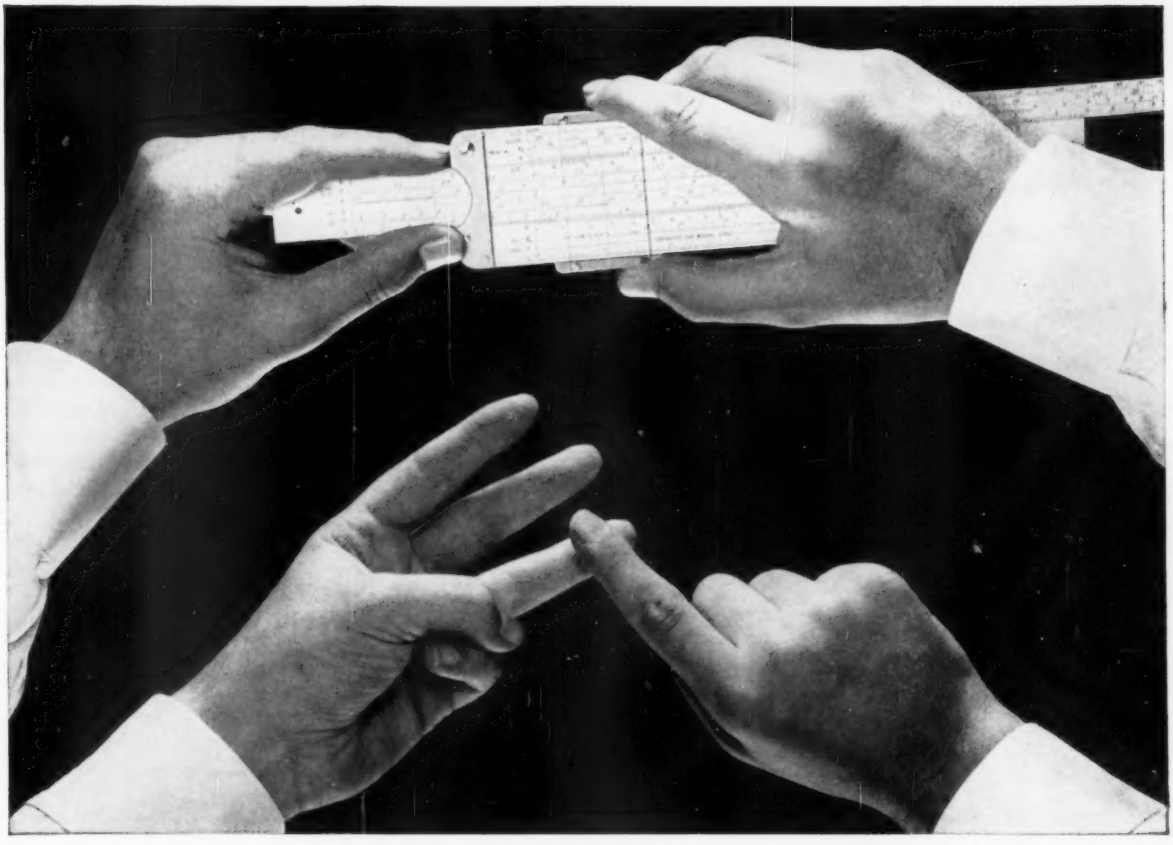


Fig. 3. Air detector circuits.

Any way you figure it . . .

DOW



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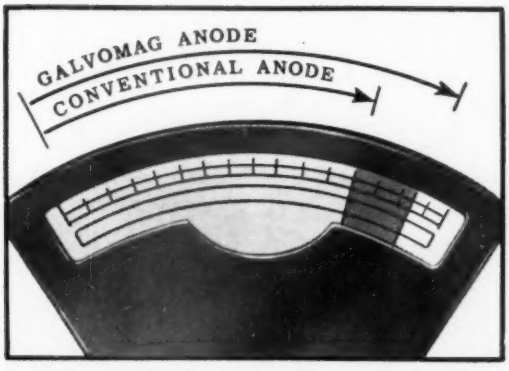

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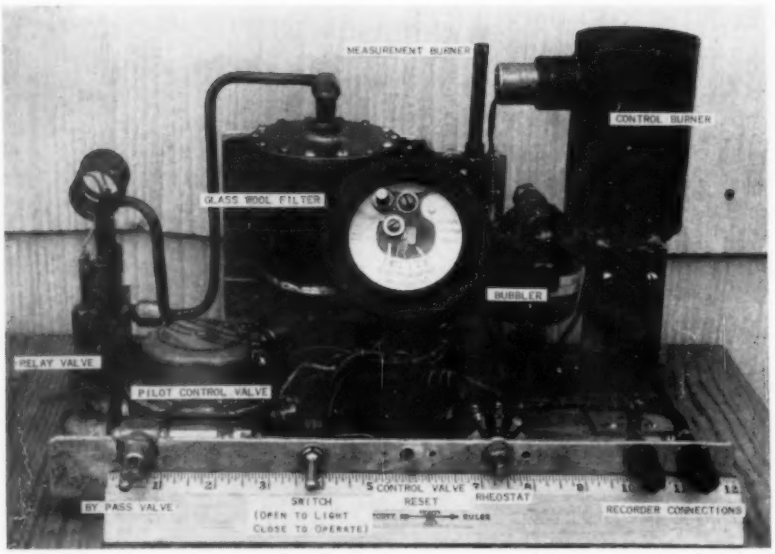


Fig. 4. Air detector without cover.

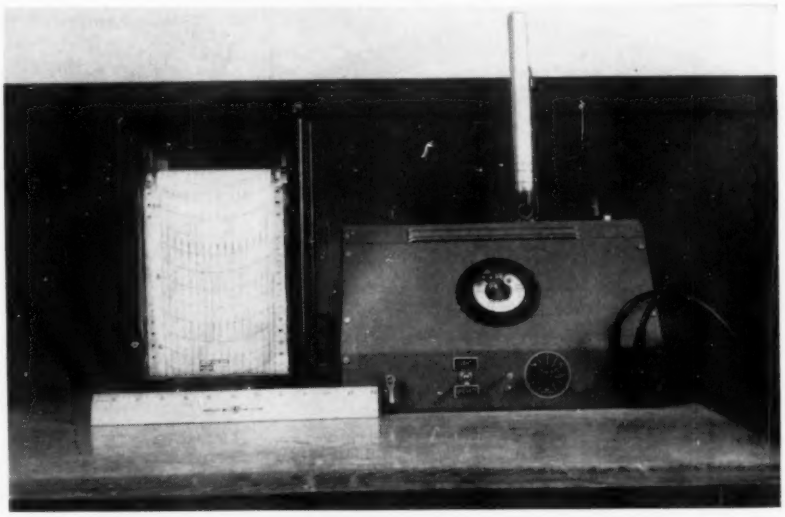
supply pressure is built up in the bellows which closes the relay valve, stopping the supply of gas to the pipeline motor valve. A small bleed valve is incorporated in the piping to the pipeline motor valve to relieve the trapped pressure when the relay valve closes. This bleed is also helpful in keeping a small flow of gas from the pipeline through the instrument, thereby making sure that a true pipeline sample is being burned.

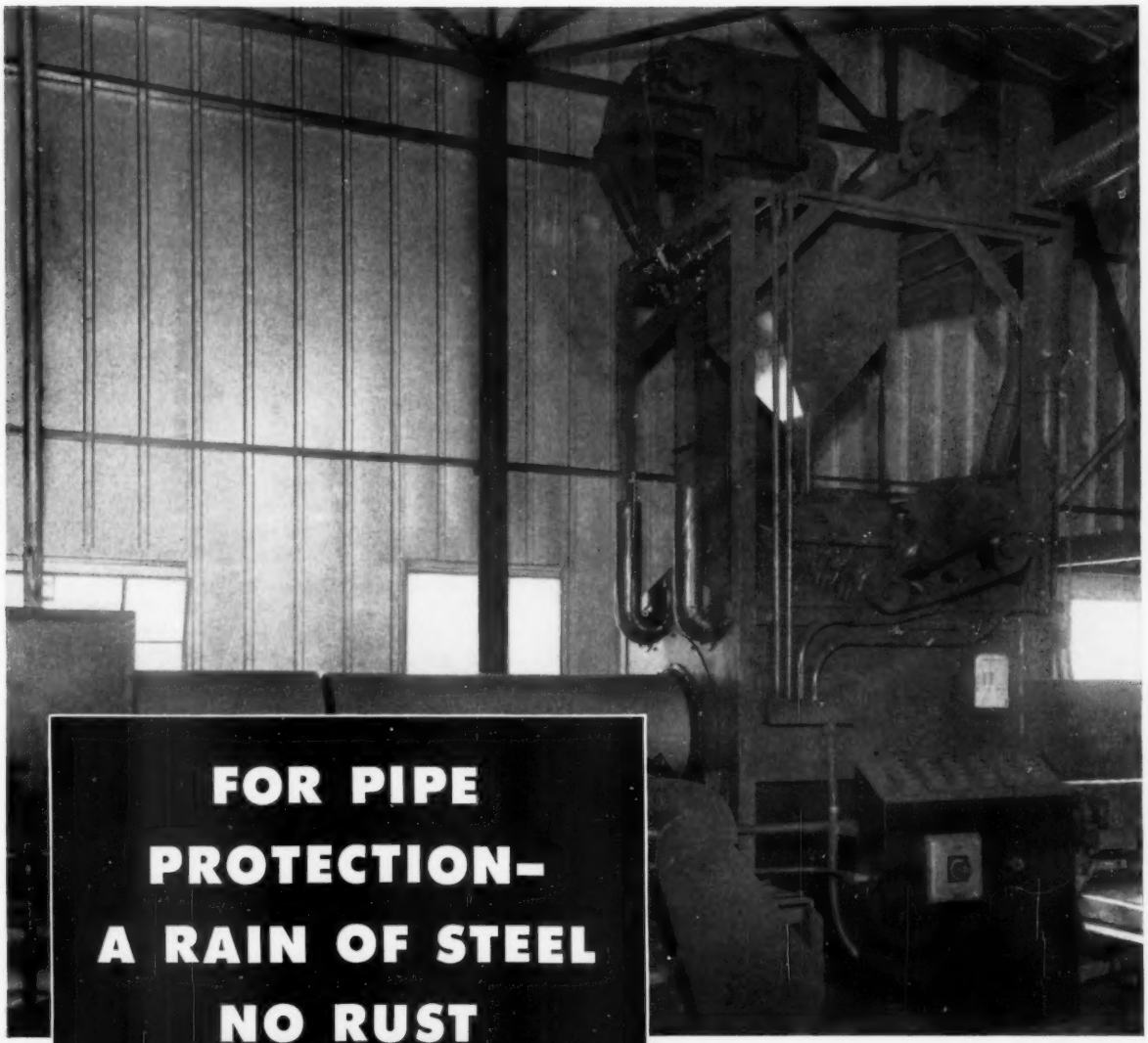
The air detector was first placed in service for testing in September 1953. It was tested occasionally by shutting off the regular gas supply and substituting a mixture of gas and approximately 30 per cent air into the instrument supply line. It never failed to operate properly and was observed to close the motor valve in the pipeline approximately one and one-half minutes after the mixed sample was turned in. Although there have been minor difficulties, such as clogged lines before a filter was put on the supply line and a faulty measurement thermopile which was attributed to a defective junction present from the time of manufacture, the operation of the instrument has been satisfactory. The detector was placed outside the building and withstood normal air currents with no ill effect for a period of 10 days. However, the device should be installed with protection since it is possible to blow out the small flames of the burners. In the event that either of the flames is blown out, the instrument will operate and shut off the pressure to the motor valve. It requires two to 10 minutes to operate in this manner because of residual magnetism in the solenoid of the control valve and heat retained by various parts. Varying the supply pressure to the air detector from 20 to 30 psig had very little effect upon its operation. Gas gravity variations and ambient temperatures did affect it slightly but not enough to hinder proper operation.

The recorder used with the air detector is not essential. It can be replaced with a .25 ohm resistor connected between the terminals provided on the front panel. In applications where a record is desired, the Esterline Angus model AW with a O-50 millivolt movement may be used. The chart required is 4322B which has numbers O-1500 printed on it so that the recorder may indicate approximate Btu values. The chart is spring driven and has an eight day drive.

There are many remote locations where this air detector can be used to advantage when no other instrument will work because of absence of an electrical supply. There are many uses for the instrument at locations where only undependable electric power is available. It has proven to be a dependable device capable of detecting much smaller amounts of air in gas than the maximum allowable. The operating point in all tests was set to allow less than 30 per cent air in the gas, but the instrument will work just as well with the operating point set to allow much less air contamination. The present model of the instrument was constructed for approximately $650, a small cost considering the operation it performs. A recorder may be attached for an additional $300 if desired. Quantity production should make the cost of the detector even lower. ■

Fig. 5. Air detector with recorder.





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WASHINGTON

Barriers stand in way of gas legislation in '57

By NEIL REGEIMBAL
GAS Washington Bureau

THE Nation's Capital rolls into high gear again this month, and after time out for some frivolity when the new Congress convenes and President Eisenhower is inaugurated, will knuckle down to the serious business of running the country.

The gas industry will be right in the middle of the legislative mill this year—as it was squarely in the middle of many an election campaign last fall.

Two important barriers stand in the way of efforts to secure legislation this year, and dreams of any easy conquest of Congress are now pretty much out the window. The basic conflict between the interests of the distributors, the pipeliners and the producers is only one of the major problems.

There is growing evidence among gas industry representatives in Washington that even after the three industry segments agree on what to ask for, there will be a tremendous tug-of-war to determine how to go about asking for it.

Agreement on the basic objectives of a new gas bill doesn't appear to be coming easily for the industry. A measure which will clarify, simplify and limit somewhat the Federal Power Commission's control, and at the same time satisfy distributors, is a knotty problem. One group of producers was, late last year, still saying that efforts of the pipelines and distributors to draft a bill based on the "utility" principle could not be accepted by them.

Various provisions are being suggested for inclusion in the next gas bill, including divorcement of gas pipelines from their producing affiliates; guaranteed fair field prices; complete exemption from regulatory controls for independent producers; provisions permitting controlled producers to withdraw their supplies; legislative restrictions prohibiting the FPC from using any costs in approving gas prices, and legal prohibitions to certain types of escalation clauses.

There are indications in Washington that there may be at least two or three widely divergent gas bills introduced this year in Congress—an eventuality that industry leaders seeking a unified approach are vigorously attempting to head off for fear it would seriously damage the chances for any legislation.

Even assuming that the industry reaches basic agreement, the question of how to go about getting it is delicate, and not easily solved. The real knot of the problem is how far the industry as a whole will have to go in making concessions to satisfy "protect-the-consumer" pressures. Disagreements already in evidence could again throw the industry into sharp conflict.

The two extreme views now range from drafting a bill literally titled, "to protect the interests of consumers of natural gas," and proceeding from there to emphasize protection of gas supplies, putting Congress on record as urging FPC to limit its controls, and giving FPC wide discretion. This should be the type of bill that Sen. Paul Douglas (D.—Ill.), might sponsor, one backer of this theory says. (Senator Douglas has been a bitter and vocal foe of gas decontrol legislation.)

"This would be form without substance," one independent producer commented on hearing the proposal. Generally, this faction demands a bill which would satisfy all parties concerned, and trying to sell it on its merits. They also argue that the courts have raised havoc with the FPC whenever it has tried to use discretion, and that setting flexible standards would just open the door for the courts to write more gas legislation.

Crux of the disagreement is simply that as an aftermath of the "Case incident" and the President's veto last year, and of the results of the 1956 elections, the outlook for gas legislation is not favorable. Many congressmen who supported the Harris bill, including those re-elected as well as some who were defeated, believe they lost lots of votes because of their stand. Aside from the representatives of the relatively few gas producing states, there is little congressional support for gas legislation. Most lawmakers would probably prefer to ignore the subject.

Although President Eisenhower has voiced sympathy with the general objective of removing unnecessary government restraints, he is believed to be only lukewarm toward gas legislation now. He undoubtedly would sign a moderate measure, but it is believed to be a virtual impossibility that he, or his administration, will actively push such legislation. The Interior Department, and probably the FPC, are expected to support such legislation only when

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Washington • *Cont'd.*

and if asked for an opinion by Congress.

It is this unfavorable climate that is motivating the group supporting "consumer's" approach to the bill. They believe any bill will be better than none. The opponents aren't sure. Some indicate they'd rather wait if necessary to get the kind of bill that would do the industry the most real good.

* * * *

Congress, from the standpoint of general legislation, is pretty much the same debating society of the last two years, with reltively few new faces and operating under the same benign "dictatorships." There is little chance that radical or startling new laws will be produced this year.

Here's the outlook for legislation in the major areas affecting the gas industry:

TAXES—With government still on spending spree, and outlays for everything due to rise, the corporate tax rate will undoubtedly be continued at 52 per cent, instead of dropping to 47 per cent as scheduled. Repeal or broad-scale rate reductions in excise taxes are also very doubtful, and personal tax cuts—if granted at all—will be small. There is strong pressure for some tax adjustments to give small business firms a break. The most likely is a reduction from 30 per cent to 20 per cent in the tax on the first $25,000 of corporate profits. There will be some restudy of the tax depletion allowances this year, but reductions are improbable. A severe business dip is about the only factor that could produce widespread tax cuts—and this is considered highly unlikely.

ATOMIC ENERGY — The tug-of-war between advocates of present government policies encouraging private industrial development of peaceful uses of the atom, and opponents attempting to force the government to take over the job, will resume with renewed fury this year. But efforts to secure passage of a program requiring the government to engage in a multi-million-dollar nuclear power reactor construction program are expected to fail again this year. As a result, in order to keep an atomic program moving ahead, Congress will probably take steps to push private nuclear development by such programs as establishing catastrophe insurance for nuclear reactors.

LOBBYING—A drive to tighten up the lobby registration laws; provide new controls over lobbyists, and bring lobbying before executive agencies of the government under the controls, is a possibility this year.

SMALL BUSINESS—One of the major legislative pushes this year will be for a wide variety of measures to aid small business firms, including relaxation of inheritance taxes; easing of depreciation laws to cover used equipment; relaxation of stock registration rules, and tougher antitrust laws, including measures requiring firms planning to merge to notify the Justice Department (not to get approval) and giving trustbusters the right to subpoena business records during a civil investigation before a suit is filed.

LABOR—The split control of government—Republicans in the White House and executive agencies; Democrats in Congress—virtually rules out any major amendments to the Taft-Hartley Labor Act, although some noncontroversial changes may get through. Extension of the minimum wage law to some retailing and service establishments will be hard fought, but probably won't make it.

Midwestern-TGT complications grow

The Federal Power Commission, after declining an opportunity to wriggle off the griddle by granting dismissal motions, is now ready to proceed on what promises to be a windy and drawn out task of nailing down a decision on which, or how many, gas lines will expand service to the northern Great Plains area.

Regardless of the legal, moral or other considerations which influenced the commission's decision to deny motions to dismiss the applications of Tennessee Gas Transmission Co. and Midwestern Gas Transmission Co. to import and export gas from Canada, it must have hurt to pass up an opportunity to just drop the whole business.

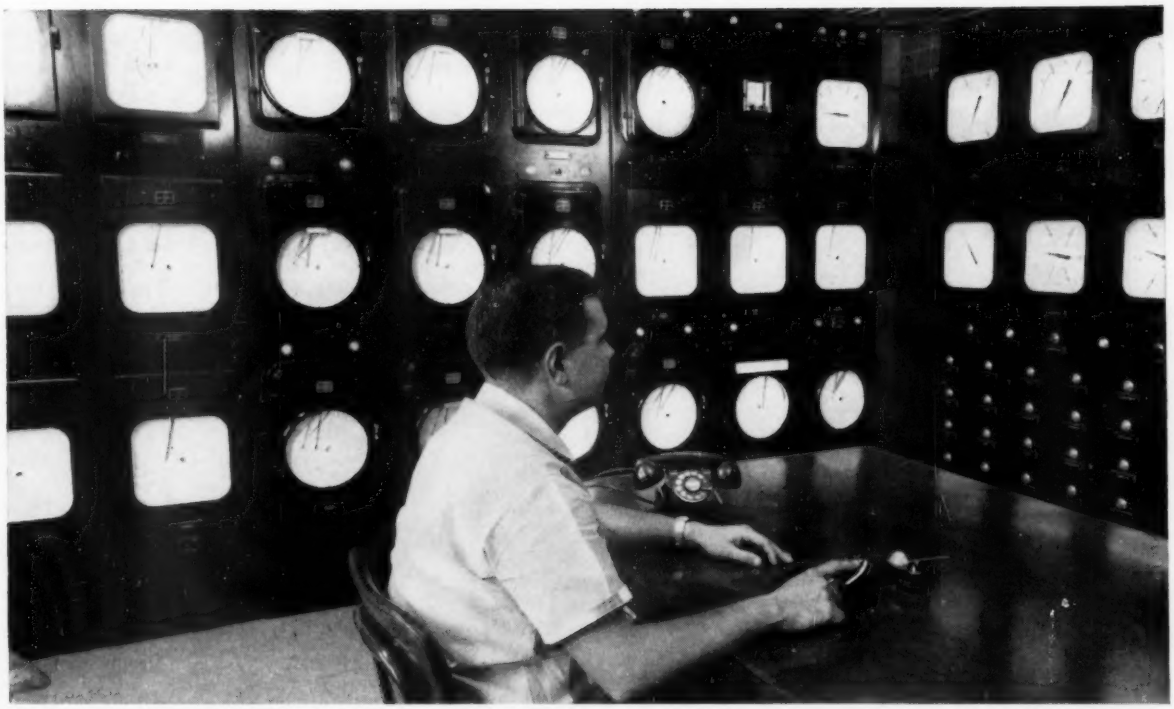
Now, the commission will start delving into issues even more complex than when the case first opened, presented by expected further consolidation of some of the competing applications into the proceedings.

There was a possibility too that the opponents of the Midwestern-TGT proposal would ask the FPC to reconsider its decision not to dismiss the case, in order to build a record with which to appeal the dismissal motions to the courts.

Probably the most weighty competitors of the Midwestern proposal are Northern Natural Gas Co., which has an application pending to build a line from Minneapolis to Duluth; Michigan Wisconsin Pipe Line Co., which proposes to extend service to a number of communities in Wisconsin, and The Peoples Gas Light & Coke Co.'s proposal to increase the capacity of its subsidiary, Natural Gas Pipeline Co. of America, by just under 500 MMcf/day to serve industrial and household customers in the Chicago area. Generally, these competitors of the Midwestern proposal did not want their cases consolidated with the Midwestern case. Arguments on both the Northern Natural and Michigan-Wisconsin proposals had been virtually completed, and only a decision held back.

Some reasonably uninvolved FPC observers are commenting that the outcome of the entire hassle—which has already produced great mounds of testimony—will be a "deal" between the competing applicants whereby there will be "a piece of cake for almost everyone."

Principals in the case say such an arrangement isn't likely for several reasons. One spokesman close to the argument points out that in the case of the competing portions of the Northern Natural and Michigan-Wisconsin applications, a compromise would be impossible, and that it's got to be



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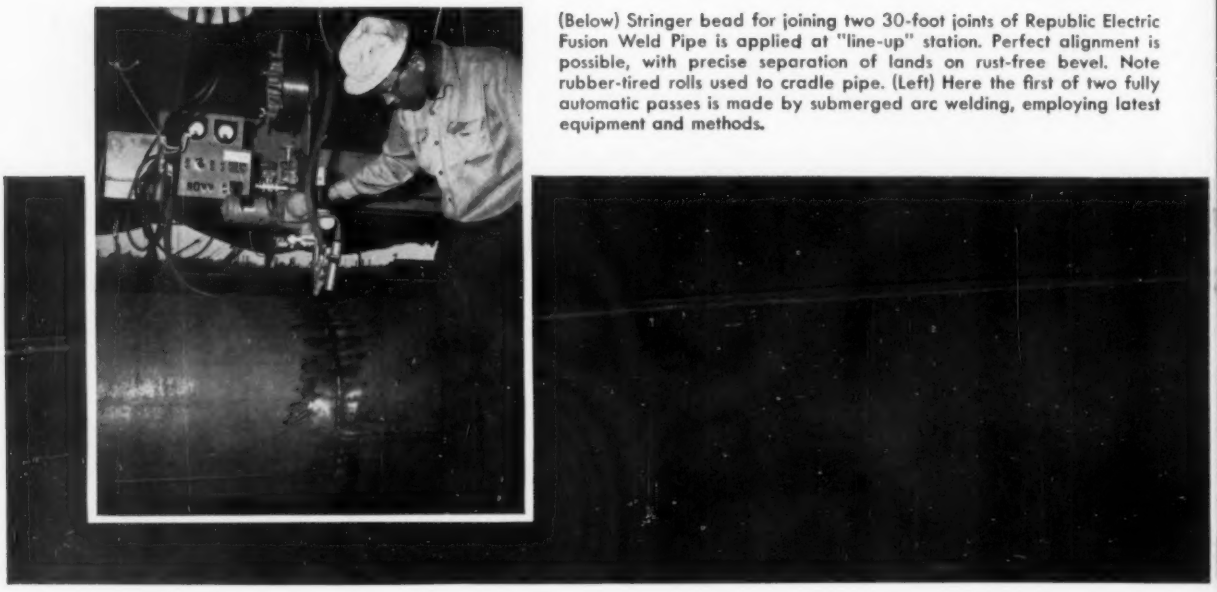

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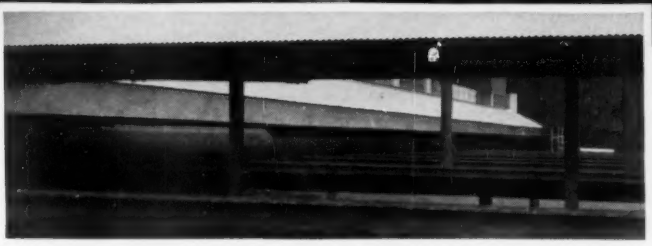
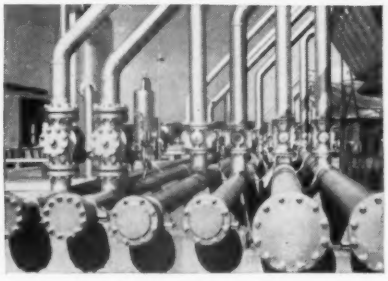


(Right) Pipe is shown on conveyor coming directly from the mill. Sheds in foreground protect ends from weather prior to midwelding. Since pipe is never stock piled welders receive joints in perfect condition.



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one way or the other. There are at least 29 competing or partly competing applications to the Midwestern case, plus another dozen outside opponents such as the coal industry and coal-carrying railroads.

The official order in which the FPC upheld hearing examiner Francis L. Hall and refused to dismiss the Midwestern application contains a blunt reversal of earlier policies blocking imported gas as a sole source of supply for a pipeline project.

This policy, the commission said, "should not be permitted to stand," because it is now possible "to envisage circumstances under which projects relying wholly upon Canadian gas could be found to be in the public interest."

The commission, however, left no doubt that while it was reversing its policies in general, it had not ruled that the Midwestern case is one in which it will necessarily permit reliance on imported gas. The wording of the order does, nevertheless, indicate that the commission agrees that some of the proposed Midwestern gas line would be dependent on Canadian gas, although the company does not concede this.

Midwestern-TGT proposal is literally a hot bed of controversy at both ends. In addition to the battles it has kicked off in this country, the Trans-Canada pipeline, which will supply it at the northern end, was approved last spring only after bitter political battles over the amount of American money financing the project.

And it's apparently not over yet. There are reliable reports that the political opposition to Canadian Prime Minister Louis St. Laurent will make a determined bid to unseat him next year, and use as one of their heavy guns the Trans-Canada project. The project, facing various deadlines on construction and financing, is behind schedule because of the steel strike in this country and normal winter bad weather, and will probably have to face up to this opposition again if it has to seek deadline extensions, as expected.

GAS progress reports

CURRENT CONSTRUCTION

ALBERTA GAS TRUNK LINE CO. LTD., to build 550-mile gathering line in Alberta. 1956 construction consisted of Red Deer river crossing near Bindloss.

COLORADO INTERSTATE GAS CO., Colorado Springs. Docket G-2121-(1956 program) 239 miles of 22-in. line from Laramie, Wyo. to connection with Pacific Northwest Pipeline Corp. line at Green River, Wyo. R. H. Fulton will start two spreads April 15. Nov. 1 completion schedule delayed due to late pipe delivery.

MICHIGAN WISCONSIN PIPE LINE CO., Detroit. Docket G-2327 15.5 miles of 4- and 6-in. line to Three Rivers, Mich. under construction; 25 miles of 24-in. in Wisconsin and 18.5 miles of 4-in. in Iowa, Illinois, Wisconsin and Michigan authorized and scheduled for completion this year. All other construction under this docket has been completed and is in operation.

MONTANA-DAKOTA UTILITIES CO., Minneapolis. Docket G-10521. Remaining compressors (two 540-hp at Baker, Mont.) scheduled for installation next summer.

MOUNTAIN FUEL SUPPLY CO., Salt Lake City. Dockets G-10426 and 10446. To build 38 miles of 20-in line and compressors to transport from Sweetwater county in southern Wyoming 60 MMcf/day purchased from Pacific Northwest Pipeline Corp. Also 2640 hp addition at existing compressor station. 5 miles line and compressors completed. Balance pending.

NORTHERN NATURAL GAS CO., Omaha. Dockets G-2399, et al, for 654 miles of line and an additional 12,640 hp in compressor capacity. Also 15-mile 24-in. line from Ogden, Iowa to underground storage near Redfield; 168-mile 20-in. from Twin City area to Duluth and Superior; 92-mile 12-in. and 71-mile 10-in. line in South Dakota and 307 mile of branch lines. Compressor additions and 15-mile line to test Redfield storage project approved. Contracts for compressors and line let to H. B. Zachary, Dresser Engineering Co., Foor Engineering Co., R. H. Fulton & Co., and Pentzien Inc. Newly approved portion includes a total of 354 miles of line and 18,640 hp in compressor capacity broken down as follows: 163-miles extension from Sioux Falls, S. D. area to Aberdeen, S. D. plus 160 miles of branch lines in South Dakota. Not approved is the Duluth-Superior extension.

PACIFIC GAS & ELECTRIC CO., San Francisco. For 83-mile 20-, 18-, and 16-in. line from Beehive Bend field near Willows, Calif., to a point near Davis and then east into Sacramento.

PACIFIC GAS & ELECTRIC CO., San Francisco. Midwestern-Johnson-Dixon at work on 85-mile, 34-in. line paralleling Super Inch from Topock, Ariz. to Milpitas, Calif. Other contractors at work on 6620-hp additions at Topock and Kettleman compressor stations.

PERMIAN BASIN PIPELINE Co., Omaha. Dockets G-9688 and 9724. For 19-mile, 16-in. line and 6750-hp compressor station in Andrews county, Texas, to take gas from Phillips gasoline plant. Gasoline Plant Construction Corp. Houston building compressor station; R. H. Fulton the line.

SOUTHERN CALIFORNIA and SOUTHERN COUNTIES GAS CO., Los Angeles. To build 236-mile, 30-in. line from Newhall, Calif. to Topock, Ariz. on Colorado river to meet El Paso Natural line from San Juan and Permian basins. Also three 1760-hp compressors at Topock. R. H. Fulton & Co., Lubbock, Texas, has contract for line. Initial work to begin this month. Scheduled for completion in June, 1957.

TEXAS GAS TRANSMISSION CORP., Owensboro, Ky. Dockets G-8828, 10062, 10395, and 10698, to lay approximately 240 miles of line along its system in Louisiana, Arkansas, Mississippi, Tennessee, Kentucky, Indiana, and Illinois and to add 31,510 hp. Work completed on 176 miles of line; compressor construction approximately 85 per cent complete. Completion of pipe work expected about Dec. 20; compressor work prior to Jan. 1. Pipeline construction contractors: Houston Contracting, Williams Bros., Union Construction, Pentzien Inc., Modern Welding, and Ashy Construction. Compressor contractors: Longview Equipment and Ford, Bacon & Davis.

TEXAS EASTERN TRANSMISSION CORP., Shreveport. Dockets G-2503, 9784-87, 422 miles of 30-in. line near Mexican border to transport gas to Texas Eastern's Vidor, Texas station; approximately 45 miles of 24-in. pipe connecting TET's existing line near Provident City, Texas, to the new line; pipeline loops totaling about 77 miles at various locations along existing 30-in. system; approximately 147 miles of supply and sales laterals; new and additional compression facilities totaling 32,250 hp; and approximately 20 sales measuring and regulating stations.

TRANS-CANADA PIPE LINES LTD., for 2287-mile gas line taking Alberta gas from Alberta - Saskatchewan border to Toronto and Montreal, with lateral from Winnipeg to Emerson, Man., 34-in. line from Alberta border to Winnipeg under construction. 30-in. from Winnipeg to Toronto; 24- and 20-in. from Toronto to Montreal; 24-in. from Winnipeg to Emerson; 10 compressor stations totaling 105,000 hp. First four sections of line under contract to Majestic Contractors Ltd., Mannix Ltd., Canadian Bechtel Ltd., and Dutton-Williams Brothers. By November, 230 miles of 34-in. had been ditched.

WASHINGTON (D.C.) GAS LIGHT CO. Docket G-10090 for 26.1-mile, 24-in. line from Dranesville, Va. to a point near Washington. Work nearly completed.

WESTCOAST TRANSMISSION CO. LTD., Calgary. To build 650-mile, 30-in. line from Peace river area to near Vancouver, B. C., to connect with line of Pacific Northwest Pipeline Corp., to transport 400 MMcf daily, of which 300 MMcf is to be delivered to PNW. 400 miles of line installed and ready for testing. Scheduled for completion in fall of 1957.

Pipe, buried for 25 years, is good as new

Applying NO-OX-ID "GG" over the cleaned surface

Next, No. 4 NO-OX-IDized wrapper for protection against abrasion

Finally, NO-OX-ID Filler Red "C," a seal coat, completes protection

THIS PIPE IS 25 YEARS YOUNG

Twenty-five years ago NO-OX-ID combinations sealed this pipe against corrosion. Today, after two and one-half decades of uninterrupted service, the pipe is as good as new.

HOW DO WE KNOW THIS?

Recently, new construction made relocation of the line necessary. Inspection revealed the original NO-OX-ID coatings and wrappers had chemically and mechanically stopped moisture penetration and corrosive attack. *Not a foot of pipe was replaced.* After cleaning and a new application of NO-OX-ID coating-wrapper combination, the pipe was lowered in. It's now ready for many more years of additional service.

Many leading pipeline companies and utilities rely on NO-OX-ID combinations for lasting pipeline protection. Consult your Dearborn representative next time you move pipe or lay new lines for the right combination to meet your soil conditions.

NO-OX-ID ADVANTAGES

Coats more feet per man-hours because less material is needed • Applied hot or cold • By hand, by Traveliner or at the mill • Requires less equipment • No noxious fumes.

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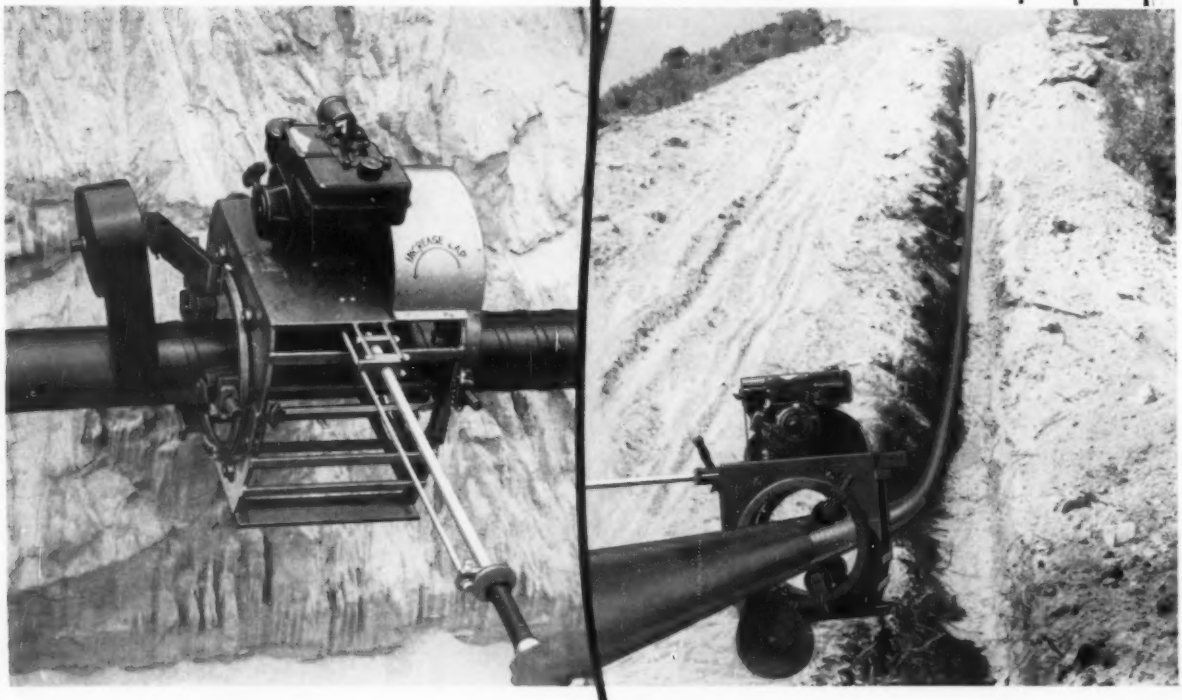
Gentlemen:

☐ Have a Dearborn Pipeline Representative call
☐ Send me NO-OX-ID literature

Name.....*Title*.....
Company.....
Address.....
City.....*Zone*....*State*.....

Spins like a spider!

Climbs like a cat!



New Plicoflex Speedmaster
pipe-wrapping machine

LIGHT IN weight but rugged, the new Plicoflex Speedmaster wraps up to 2,000 feet of pipe per hour on level going, takes sharp turns in stride, works its way over steep grades and through the toughest terrain.

As shown on the right above, the Speedmaster operates successfully on slopes so steep a man can scarcely stand! This six-mile-long job, at elevations from 8,500 to 10,000 feet, was completed in six 6-hour days, using only one side-boom cat for priming, wrapping and lowering the pipe into the ditch. Extremely sharp turns were negotiated without cutting pipe, thus eliminating welding pipe and wrapping field joints.

Due to the extra thickness and resiliency of Plicoflex butyl rubber-polyvinyl chloride tape used, it was not necessary to shield the pipe before backfilling, despite rockiness of the soil.

Plicoflex tapes and equipment give you faster pipe wrapping with minimum equipment and minimum manpower. You make more money on every job!

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P.O. Box 22052, Los Angeles 22, Calif.

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GAS pipeline news

TET offers financing plan for Little Inch conversion

Texas Eastern Transmission Corp., Shreveport, is seeking SEC approval to register $40 million of 20-year debentures to be offered for public sale principally to help finance its expansion and reconversion program of the Little Big Inch.

Proceeds of the sale will be used to prepay $28 million in revolving credit notes, and the balance for the expansion and reconversion program.

According to information filed with the SEC, the total cost of reconverting and extending the Little Big Inch to transport petroleum products will cost about $35 million. Another $64 million will be needed to construct substitute facilities to replace the gas capacity of the line.

U. S. stock sale sought by Trans-Canada

Trans-Canada Pipe Lines Ltd. will attempt to raise funds by selling stock in this country.

The line, partly financed by Canadian government loans, is seeking permission to register with the U. S. Securities and Exchange Commission $80 million of 30-year subordinated debentures and 4 million shares of $1 par common stock. Among the underwriters in this country are Lehman Brothers, Stone & Webster Securities Corp., and White, Weld & Co.

The stock will go on sale simultaneously in Canada and this country.

The 2287-mile line will have an initial delivery capacity of about 300 MMcf/day and is designed to increase to about 780 MMcf. Total cost of the line at 300 MMcf is about $230.6 million.

In addition to the stock sale, some $144 million of first mortgage bonds, due in 1978, will be sold to institutional investors. Some of the proceeds of the financing will be used to redeem 5 per cent first mortgage bonds issued by the company to the government Crown Corp. established in Canada to aid financing of part of the western section.

Principal holders of outstanding common shares of Trans-Canada now are the Canadian Delhi Oil Ltd., 490,040 shares (25.7 per cent); Hudson's Bay Oil & Gas Co. Ltd., 327,790 shares (17 per cent); British American Oil Co. Ltd., 17 percent, and Tennessee Gas Transmission Co., 17 per cent.

Gas treating facilities boost Canadian economy

The new gas treating facilities being constructed for Westcoast Transmission Co. Ltd. and Pacific Petroleums Ltd. at Taylor, B. C., will become northern Canada's largest new industry.

George L. McMahon, president of Pacific Petroleums, whose company is presently building the scrubbing plant for Westcoast and the refinery for itself, announced that Pacific and Phillips Petroleum Co. have entered into an agreement for construction by Phillips of additional refinery facilities which will produce, among other items, the highest grades of aviation gasoline.

The new operation, combined with the gas scrubbing plant, the sulfur plant and other phases of liquid hydrocarbon recoveries "will result in a $30 million industry for northern British Columbia," Mr. McMahon said. "It will employ several hundred persons," he added.

The $15 million scrubbing plant is now under construction for Westcoast at Taylor, approximately 13 miles southeast of the town of Fort St. John, B. C., the center of one of Canada's largest natural gas fields.

Westcoast has also announced a new contract with Phillips to purchase an additional 65.2 MMcf/day of gas produced from Phillips' British Columbia holdings.

Westcoast's line, now under construction, will start its initial deliveries to market in the fall of this year at the rate of 400 MMcf/day.

Gulf cancels Am-La sales; new reserves purchased

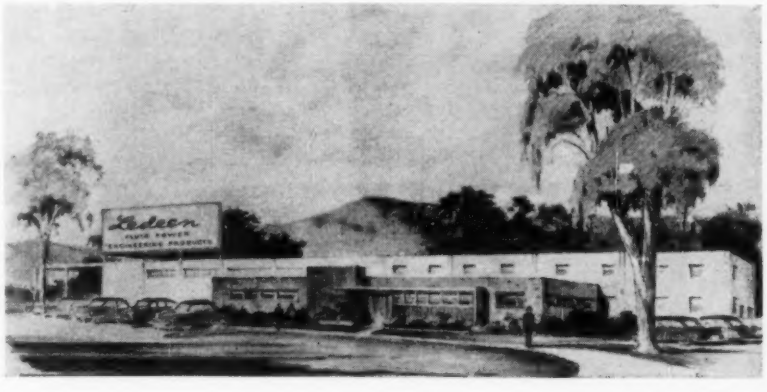
American Natural Gas Co., parent of American Louisiana Pipe Line Co., said its plans to continue expansion of its pipeline systems will not be altered by the action of Gulf Refining Co., which is seeking to cancel contracts for additional gas reserves.

An FPC examiner broke off hearings on permanent authority for American Louisiana to boost its daily capacity to 400 MMcf from 300 MMcf at a cost of $16 million. The company now has a temporary permit for 60 MMcf of the expansion.

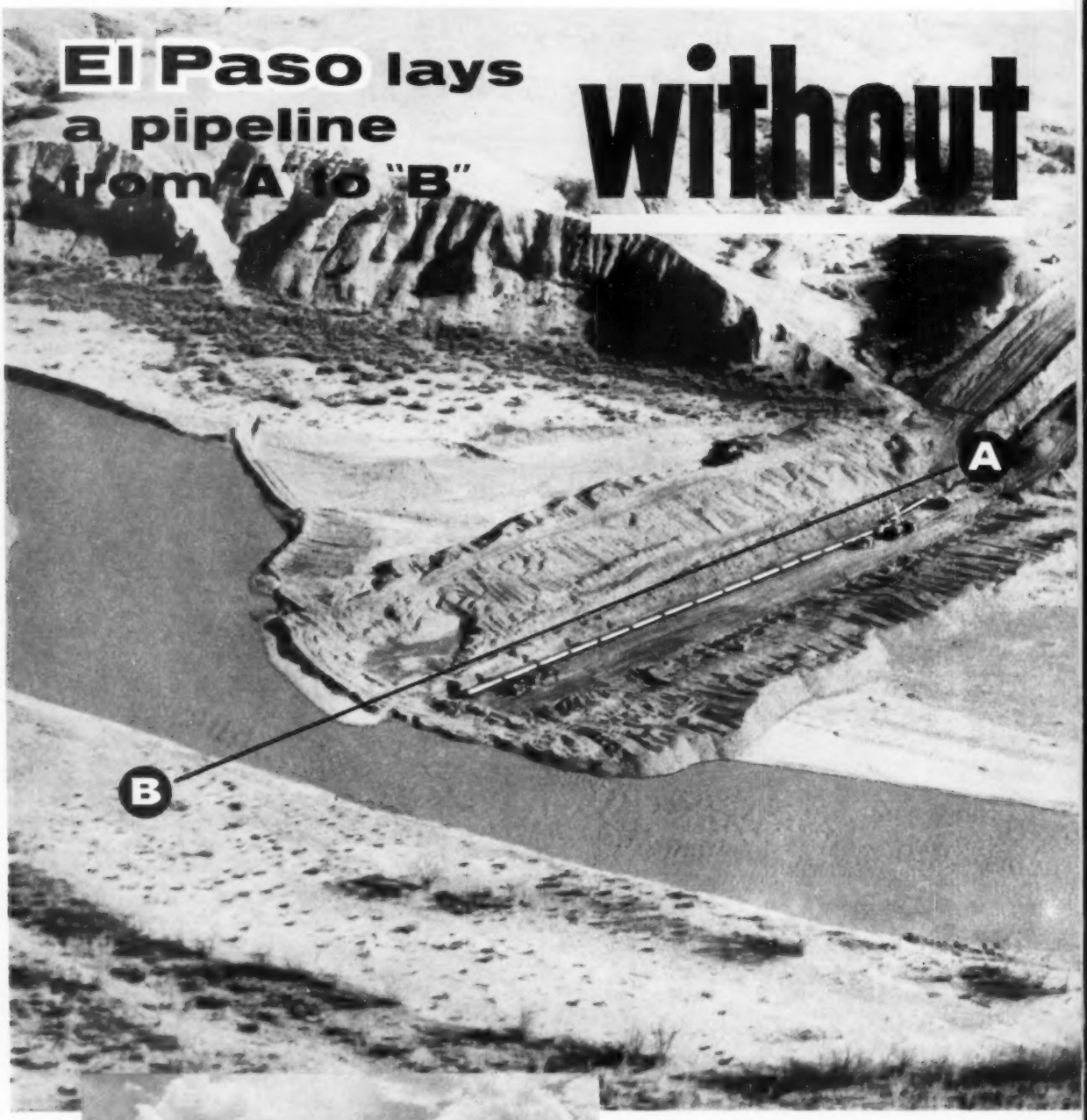
An FPC spokesman noted that pacts between producer and pipeliner could be dropped in six months if the commission had not approved the pipeline concern's expansion plans. The spokesman said he knew of no case where a company failed to get permanent authority after building facilities under a tem-

---

Ledeen Manufacturing Co. has moved into its new building in El Monte, Calif. In addition to housing Ledeen, the new building serves as headquarters for Engineering Products Co., a subsidiary. Approximately 30,000 sq ft is covered by the building which, together with grounds, involves an investment of approximately $200,000.



El Paso lays a pipeline from "A" to "B" without

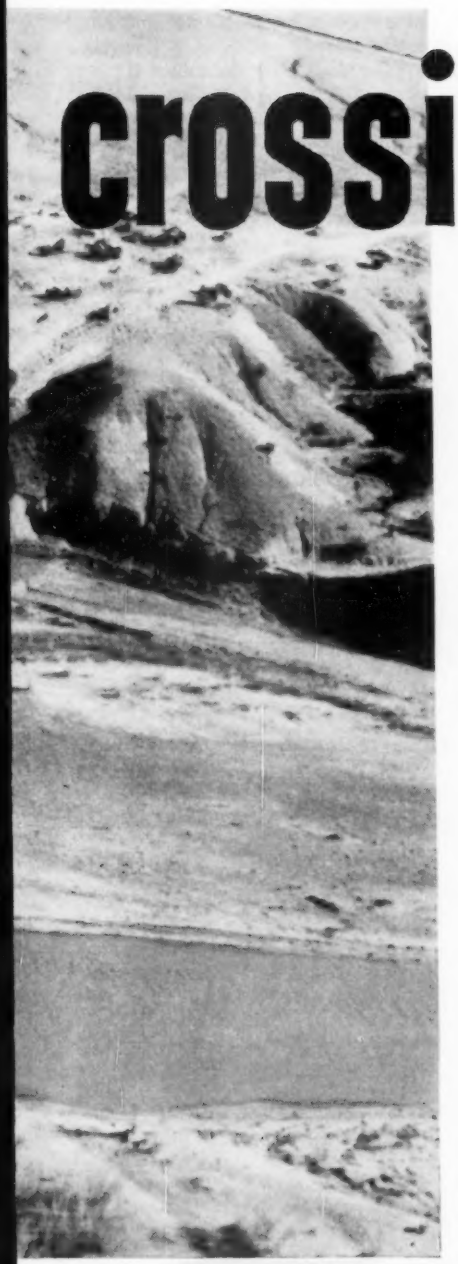


▲ El Paso spreads cross the San Juan river in northern New Mexico. Pipe was first laid to the edge of the main channel. Then an earthen dam was built upstream. Water flow shifted over the section of line near the far bank and the 800-foot crossing was completed. Trench depth averaged 20 feet, pipe was anchored every 40 feet with tie-down clamps bolted 9 feet deep in the shale.

◀ Laying the 34-inch pipe across the red desert of the Navajo Indian Reservation of Northern New Mexico.

From San Juan, New Mexico, the line travels across the red desert of the Navajo Indian Reservation of Northern New Mexico and through the Foothills of the San Francisco Mountains in northern Arizona near Flagstaff. Near Holbrook, Arizona, it extends under the little Colorado River (approx. 500-ft. crossing). At its terminus, the line stretches 1,100 feet across the Colorado River on a pipeline suspension bridge being built jointly by El Paso and Pacific Gas and Electric Company. ▶

crossing the river!



THEY PUSHED THE RIVER ASIDE! El Paso Natural Gas Company laid their line to the edge of the main channel first, then temporarily diverted the river and used dry land methods to lay the pipe through the main channel. El Paso spreads report the crossing went without a hitch, and was less expensive than going under or over the river by usual methods.

Completed line to increase capacity by 450,000,000 cubic feet per day

Taking approximately 350,000,000 cubic feet daily from the San Juan Basin and another 100,000,000 cubic feet from the Permian Basin, the San Juan-Topock project, as it's called, will increase the company's total deliveries to over two and one-third billion cubic feet daily. Begun in early 1956 and scheduled for completion in early 1957 the new line will supply an additional 350 million cubic feet daily to customers in California and an additional 100 million cubic feet daily to customers in Arizona, New Mexico, Texas and Nevada. The 34-inch line, for the most part, will loop two existing lines (24 and 30-inch) which extend from the San Juan Basin to Topock on the California border.

A. O. Smith supplying 34-inch pipe for two-thirds of 338-mile project

Approximately 224 miles of 34-inch pipe was shipped to El Paso spreads from A. O. Smith Corporation of Texas' plant at Houston. For almost 30 years A. O. Smith line pipe has always been manufactured to a high standard of quality . . . precisely controlled at every step of production. That's why A. O. Smith pipe, made and installed in 1928, is still in operation. That's why so much A. O. Smith pipe is in nearly every important high-pressure line.

Through research A.O. Smith *. . . a better way*

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TUBULAR PRODUCTS DIVISION
Milwaukee 1, Wisconsin

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INTERNATIONAL DIVISION: MILWAUKEE 1, WISCONSIN

porary permit, which is good until revoked.

Shortly after Gulf's cancellation announcement, American Louisiana announced the purchase of 180 billion cu ft of additional gas reserves, in addition to 70 billion that was scheduled to be connected to its lines late in November. These reserves will provide the line with approximately 25 MMcf/day.

The new gas supply is located in the North Holly Beach and Second Bayou fields in Cameron parish, La.

Ralph T. McElvenny, chairman of the company, said "The purchase of this additional 250 billion cu ft of gas reserves is a part of the program of American Louisiana to expand its facilities to meet all the requirements of the public in the market areas it serves.

"Acquisition of additional gas supplies is now under way and more gas reserves will be purchased as they are needed."

American Louisiana is buying the new reserves from Tidewater Oil Co., Tennessee Gas Transmission Co., Oil Participations Inc., Frankfort Oil Co., and Union Producing Co.

IRS hits hauling, stringing operations

Internal Revenue Service hair splitters have thrown a curve at firms collecting their pay by hauling and stringing pipe for utilities and gas and oil pipelines, but in some cases may be making it possible for the gas industry to save money.

IRS has ruled that when a transportation firm hauls pipe to the right-of-way for the line, and also is paid for "stringing" the pipe, the entire operation is subject to the transportation tax. The tax is due whether the carrier (usually a trucking company) actually does the stringing itself, or subcontracts the stringing to another firm.

But if the carrier simply hauls the pipe, and the line does its own stringing, or makes a separate contract for the stringing, the transportation tax does not apply.

Stringing, according to IRS experts, consists of "removing the pipe from the truck and placing it in an end-to-end position alongside the pipeline ditch preparatory to welding." Since the transportation tax applies to "loading, unloading, handling, or any other accessorial services," furnished in connection with a taxable transportation of property, a line could save some money by unloading the trucks itself.

Producing property owners may be hit by tax revision

Congress may close what has been termed a tax loophole and raise taxes for some owners of gas and oil producing property, and thus perhaps raise, somewhat, production prices.

A House Way & Means subcommittee, headed by Rep. Wilbur D. Mills (D.-Ark.), has proposed revising the tax laws to tax the proceeds of the sale of oil and gas rights at the regular income rate. At present, owners of gas and oil producing property can reduce their federal income taxes by selling for a flat sum their right to the production, either for a limited time or for a set quantity.

Midwestern-TGT dismissal denial upheld by FPC

Presiding Examiner Hall's decision denying dismissal motions in the Midwestern-TGT effort to import and export gas from and to Canada has been affirmed by the Federal Power Commission (see GAS, November, 1956, p. 118).

In affirming Mr. Hall's decision, the FPC said that "the issues posed here are too important in the public interest and the effects on the public of our answers to them are too critical to dispose of these questions without a full consideration of a record in which the applicant has an opportunity to prove such basics as gas supply, markets, engineering design and financial feasibility, while at the same time is given an opportunity to establish the much more delicate case that the public convenience and necessity requires the service sought."

However, the commission said that unless "all matters of judgment and discretion are resolved in favor of the applicant, it is questionable whether or not the certificate herein applied for should issue."

The commission said that the question of whether Midwestern or some other pipeline company should serve any area for which mutually exclusive applications have been filed cannot be finally decided until a full record is made. Competing applications have been filed by several of the intervening pipeline companies which filed motions for dismissal.

Companies seeking dismissal of the Midwestern applications argued that all of Midwestern's Minnesota and Wisconsin customers north and west of Eau Clair, Wis., would be wholly dependent upon Canadian gas and that this would be contrary to past commission policy. Commenting on this, the FPC said that its earlier opinion does not require the dismissal of the Midwestern-TGT proposals at this time.

The commission said that without undertaking to pass upon what authorizations, if any, should issue in these proceedings, it had concluded that the views expressed in the prior decision disapproving of reliance in this country on Canadian gas as a sole source of supply "should not be permitted to stand." The commission declared that it is possible "to envisage circumstances under which a project relying wholly upon Canadian gas could be found to be in the public interest, depending on the particular facts of a given case."

Inadequacy of system design brings rejection

Three applications seeking gas service from Panhandle Eastern Pipe Line Co. and Trunkline Gas Co. were approved by an FPC presiding examiner who at the same time denied four others seeking similar service (Dockets G-8471, et al).

The seven applicants are Franklin, Ill., seeking gas from Panhandle; and Hickman, Clinton, La-Center, Bardwell and Wickliffe, Ky., and the Lake County Utility District in Tennessee, all of which sought gas supplies from Trunkline. Originally, the FPC found that the applicants had fallen short of making a showing that would justify the requested orders. However, the commission said that they would be given further opportunity to provide the economic and financial feasibility of their projects.

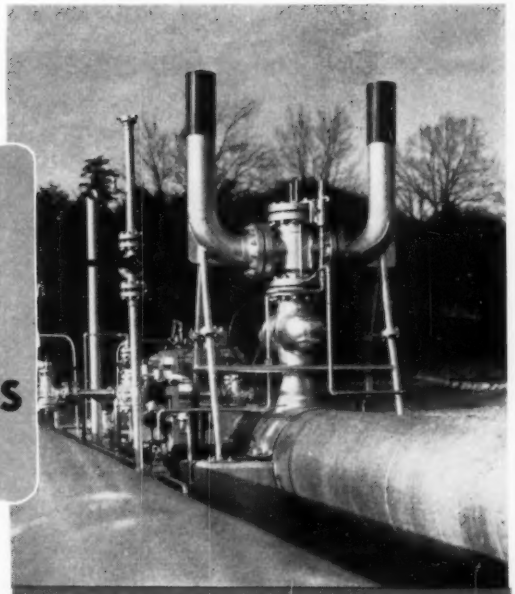
Presiding Examiner Howell Purdue approved the proposals of Franklin, Ill., Hickman, Ky., and the Lake County Utility District. In denying the others, he said he was disposed to afford opportunity

(*Continued on page* 130)

got

DOUBLE DUTY

PRESSURE RELIEF VALVES



Garrett Relief Valve with Garrett Relief Valve Operator installed on a major gas transmission line in safety shut-down service.

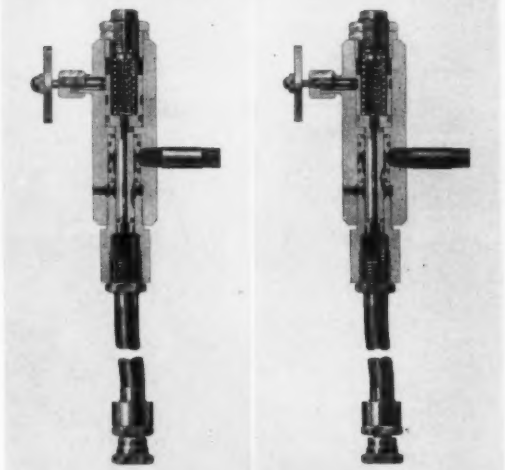
1. RELIEF VALVE
for protection against overpressure

2. BLOWDOWN VALVE
for safety shut-down systems

Safety shut-down is an important extra service provided by Garrett Relief Valves at very little additional cost . . . a service that in no way affects the function of the valve in its more conventional duty of protecting against overpressure.

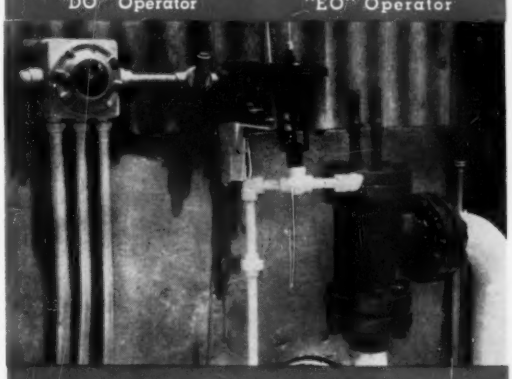
Safety shut-down service can be obtained with any Garrett Relief Valve . . . new or those already in operation . . . through the addition of a Garrett Pressure Operated Relay, and a solenoid valve or other suitable control for releasing pressure in the bonnet chamber of the relief valve. The relief valve can be opened from any remote location, manually or automatically, and the line blown down at will.

For full information on double duty Garrett Relief Valves, contact the Garrett representative in your area, or write to our Longview office. Valve sizes range from 1" through 8", single or dual outlets, for working pressures from 25 to 5000 psi.



Garrett Type "DO" Operator

Garrett Type "EO" Operator



Garrett Relief Valve with solenoid valve controlling instrument air to diaphragm motor valve, venting Garrett Relief Valve.

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P. O. BOX 2427 • LONGVIEW, TEXAS

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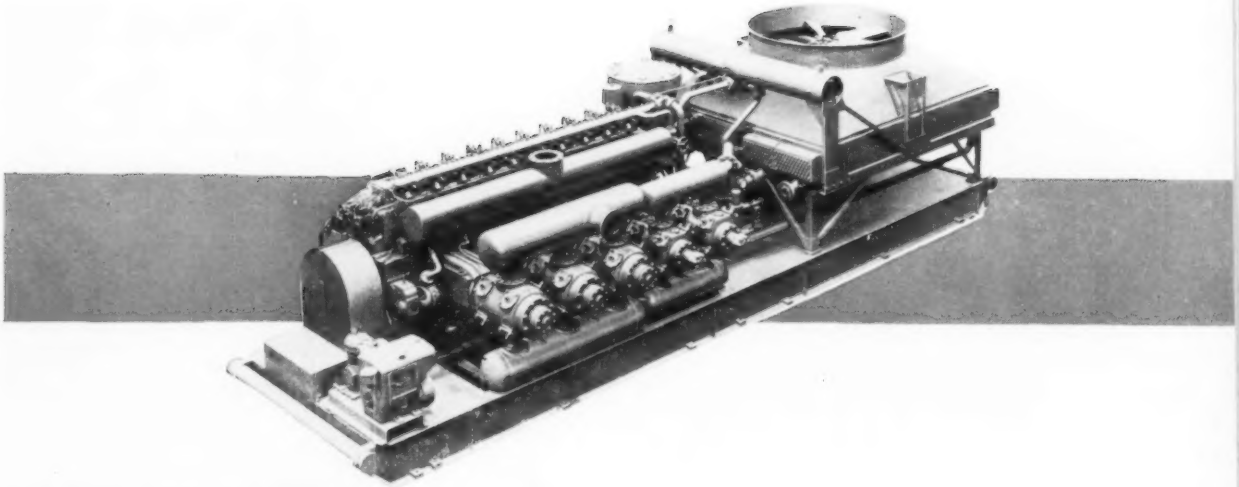
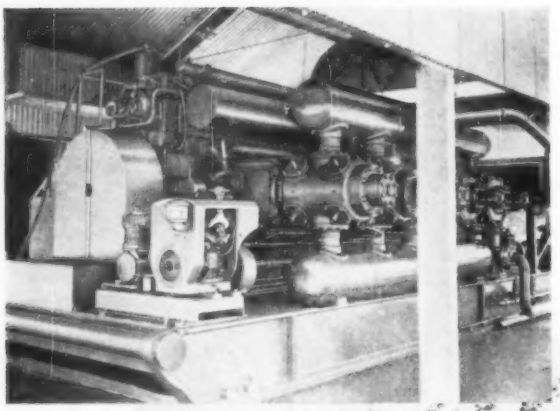
New York, N. Y.





"Highly

A performance report from

The La Gloria Corporation

on the First **Clark**

HMAB-10 "Midget Angle" packaged

compressor station installation

satisfactory"

Now over 7000 hours on stream

After 7000 hours of hard 24 hour a day service the performance of the first HMAB-10 Midget Angle installed is reported as being "highly satisfactory." There has been a complete absence of mechanical failures with only routine maintenance required.

The HMAB-10, installed at Waskom, Texas, is a completely self-contained packaged compressor station developing 550 bhp. The La Gloria Corporation is using it to gather gas at 50 psig. and compress it in two stages to 980 psig. Subsequent to after-cooling, the gas is piped to a gasoline plant where it is stripped and sold to a pipeline company.

Similar in appearance to the smaller HMA, the new unit incorporates the basic design features of the HMA as well as many new innovations. Foremost of these is a new radiator and hydraulic radiator drive. Both the radiator and drive have completely measured up to expectations with flawless operation.

Substantial savings in erection time were realized at Waskom because the HMAB-10 was delivered as a factory tested, completely assembled unit. Balanced/Opposed design greatly reduced foundation needs.

One very important consideration for users of this 550 bhp. unit is the fact that it is equipped with five compressor cylinders as standard equipment. If field pressures drop excessively, conversion to three-stage operation is easily accomplished. There is also ample physical space in the radiator to add another cooling section for additional intercooling. Demand for this new unit is heavy but new production facilities will soon be ready to speed deliveries. Be sure to get all the facts on the HMAB from your nearest Clark representative.

CLARK BROS. CO., OLEAN, NEW YORK

One of the Dresser Industries

Offices in Principal Cities Throughout the World

CLARK®

Packaged Field Compressors

DEPENDABILITY

...EVEN WITHOUT STANDBY...
WITH RCA MICROWAVE

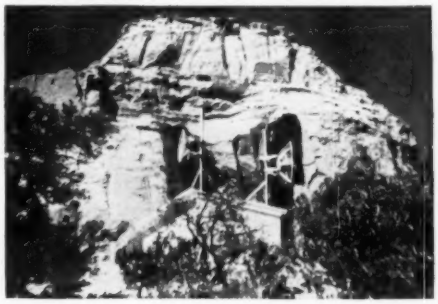
IN VITAL 2-SYSTEM OPERATION AT EL PASO NATURAL GAS CO.

The dependability and flexibility of RCA CW-20 Microwave equipment have been demonstrated at El Paso Natural Gas Co. An original 290-mile pipeline installation in Texas, in 1953, has more recently been augmented by a newer 475-mile system in western Texas and New Mexico . . . achieved with a minimum of expense.

According to the Superintendent of Communications of El Paso Natural Gas Co., outage time has never been more than 1%—without standby and wholly without overtime maintenance. In addition, it has been possible to rearrange the systems to fit new requirements as they arise.

The original installation with short-haul leg circuits was used for voice channels and telemetering. Because of its reliability, additional channels were added, and RCA Equipment was chosen for the second installation.

Routes of El Paso Natural Gas Co.'s pipeline microwave systems in mountainous regions of Texas and New Mexico, and (below) microwave antennas on mountain.



RCA MICROWAVE assures the most advanced engineering features. Provision for the addition of future channels makes it the least expensive form of communication per channel mile. Equipment utilizes easy-to-service familiar circuits and conventional tubes. Single side-band suppressed carrier frequency division multiplexing is used exclusively to meet high standards of dependability. Frequency is controlled only from the terminals through the entire system. Furthermore, RCA provides the nation-wide services of the RCA Service Company to keep entire system operating at its peak.

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Please send me latest literature on RCA Microwave.
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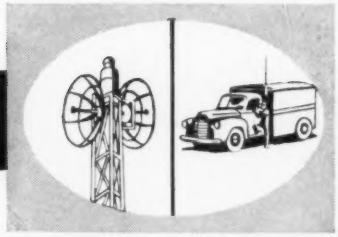
communications



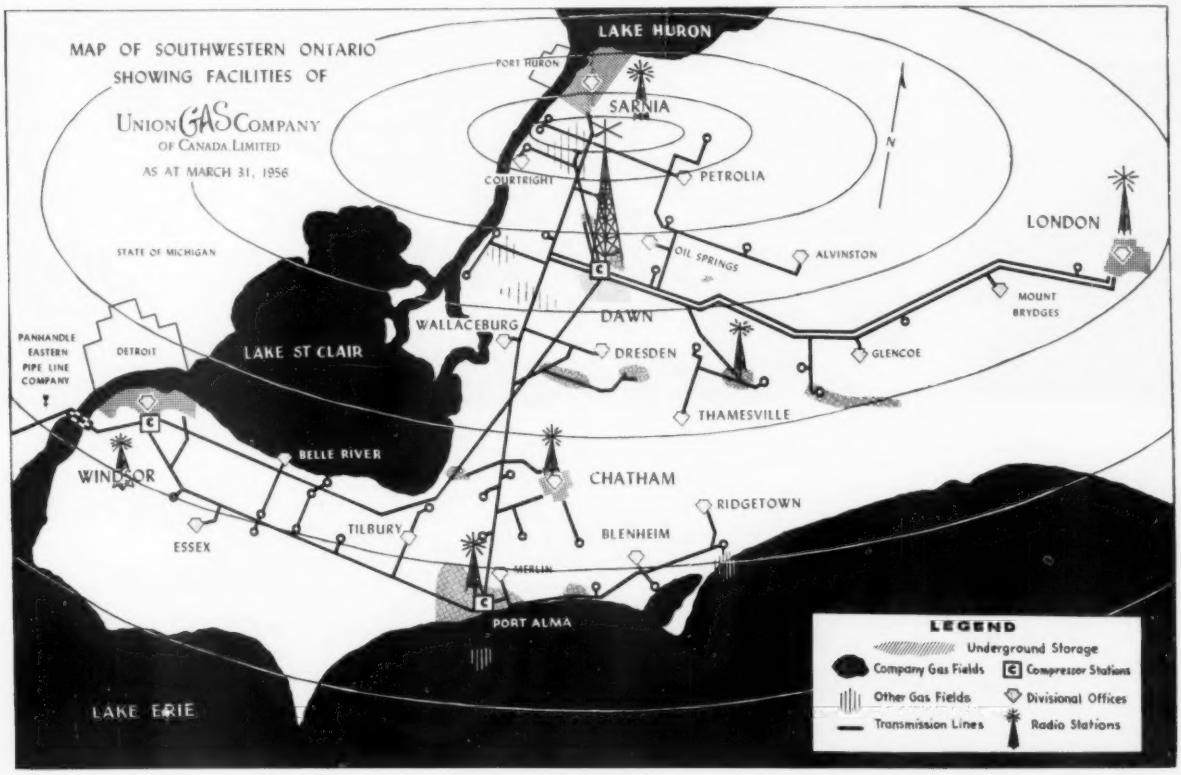
By FRANK CHAPMAN

Union Gas of Canada has versatile radio system

THE radio communications system of the Union Gas Co. of Canada is designed as a functional part of the company's operating divisions and provides a wide variety of services throughout the company's operating area (see accompanying map).

The system covers substantially all of the southern Ontario peninsula from Windsor on the south to Sarnia and London on the north and east. If current plans materialize, the system will be expanded as far east as Hamilton within the next year. Throughout this area, the company's radio facilities serve such divergent functions as construction and maintenance operations, gas dispatching, and personnel involved in drilling and production of gas.

Focal point of the system is Dawn, which is the company's gas dispatching control point. Gas operating data, including pressures and flows at each of the company's major control points, are transmitted by voice once each hour to the Dawn station. Other stations in the system are Windsor; Chatham, the company's business and executive offices; Port Alma, site



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Perfect "coating weather" and *controlled protection* are now available to you in *eight* completely equipped Pipe Line Service plants. They're strategically located across the country, from Monmouth Junction, N. J., to the brand-new plant at Provo, Utah. Big acreage is provided for your convenience—and so that the *delivery date you specify is the date we meet.*

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CENTRIFUGAL COMPRESSORS

for NATURAL GAS SERVICE

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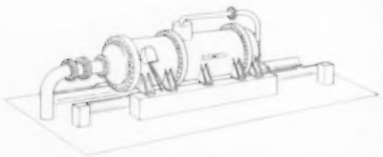
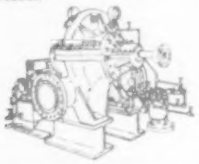
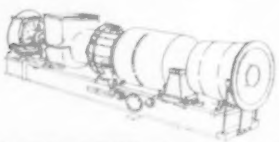


FIRST CENTRIFUGAL PIPE-LINE COMPRESSOR Built by Ingersoll-Rand in 1931, this centrifugal pipe-line booster consists of a six-stage compressor driven by a 3550 rpm, 3000 hp motor, all encased in a pressure vessel.

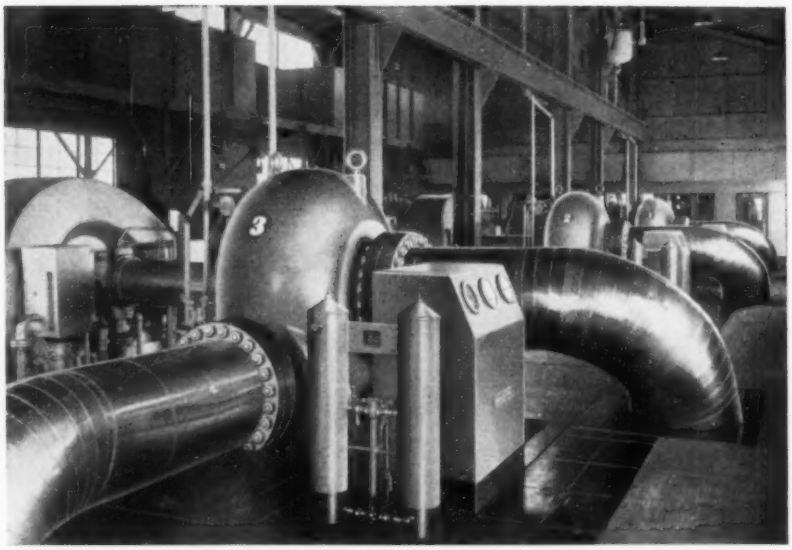


FIRST COMMERCIAL APPLICATION of centrifugal pipe-line compressors was made in 1947. A total of 78 electric-motor-driven, single-stage I-R centrifugals were installed, to handle approximately 250 mmcfd.



FIRST GAS-TURBINE-DRIVEN UNIT Installed in 1949, this Ingersoll-Rand centrifugal compressor, powered by an 1850 hp simple cycle combustion gas turbine, was the first gas-turbine-driven centrifugal compressor developed and applied to pipeline service, and was designed for a flow of 192 mmcfd at a ratio of 1.18.

FIRST 2000 PSI CENTRIFUGAL GAS COMPRESSOR This Ingersoll-Rand 5000 hp double-case centrifugal compressor was the first unit ever built for handling natural gas at a discharge pressure of 2000 psi.



Three of 8 Ingersoll-Rand centrifugal compressors installed on a large natural gas pipe-line. Each unit is driven by a 5000 hp gas turbine.

This experience means MAXIMUM DEPENDABILITY in modern pipe-line service

FROM the very first pipe-line installation, Ingersoll-Rand has pioneered in the development of centrifugal gas compressors for higher and higher capacities and pressures. And every step of the way, dependability of performance has been a prime consideration in every detail of design and construction. This is why more I-R Centrifugal Compressors have been sold for natural gas service than any other make . . . . a total exceeding 325,000 hp for this service alone.

Backed by such long and successful experience, the modern I-R centrifugal gas compressor is your best assurance of trouble-free performance and long-range economy in gas transmission service.

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of major production; Sarnia, London and near Thamesville.

Because of its central location in the company's operating area and the fact that it is equipped with a 250-ft antenna tower, Dawn station can consistently cover all other stations in the area. Mobile units operating in the entire area can at all times reach at least one

George Ryan, superintendent of the Dawn zone division, uses mobile radio at gas well drilling site.

of the base stations. The system operates on a frequency of 160 mc.

Mobile-to-mobile communication is used extensively during construction and maintenance operations for maintaining contact between work groups. It is also used in the field by drilling and production personnel in reporting a wide range of information.

Customer service dispatcher at Union Gas' Windsor office uses radio system to contact service crews.

Although the company's system is confined to a relatively small area, it is an integrated company with distribution, transmission, storage and production facilities. The radio system is designed to serve all these various divisions when needed.

Normally the system is not used for regular customer service dispatching. This service is handled by wire line when needed.

The area served by Union is often plagued by heavy sleet and snow storms during the winter, and it is during these periods when wire line communication is unreliable—if available at all—that the radio system is found to be invaluable. During any such period radio is used for every conceivable phase of company business.

Motorola progressing on high frequency test

Motorola Inc. recently filed a letter with the Federal Communications Commission outlining the progress made on its project to evaluate the propagation characteristics of frequencies in the vicinity of 900 megacycles, in order to determine if conditions in this region are favorable for vehicular communications.

The letter points out that in accordance with an experimental authorization granted by the FCC in December 1955, a series of mobile surveys was made during the month of March, when the necessary equipment was first available, to evaluate the relative degree of urban coverage by the mobile units using both 160-mc and 900-mc equipment. Signal strength and audio recordings were made of hundreds of transmissions in the Chicago urban area.

Additional propagation tests were conducted during the month of April to obtain data as to the coverage reliability of the 900-mc band in the Chicago suburban area within a 20-mile radius of the base station. During the latter part of June 1956, the aforementioned tests were repeated to determine if foilage would cause any significant change in the propagation characteristics at the test frequencies. It was found necessary to make additional tests during the month of August to substantiate some of the test data gathered in June.

Motorola indicates that the data gathered during the tests are so voluminous that a time and manpower problem has arisen in translating the recorded tape data into tabular form. Only after these data can be classified and analyzed will it be possible for them to draw an intelligent conclusion as to the feasibility of utilizing frequencies in the 900-mc portion of the spectrum for reliable vehicular communications.

To date, approximately 75,000 ft of dual track magnetic tape has been recorded by Motorola in addition to more than 5000 ft of graphic recordings and voluminous written notes. The company's efforts are currently being directed toward the classification of this information into categories which will permit the evaluation of the 890-940-mc band under many diversified conditions. It is expected that compilation of the data will be completed soon.

The letter to the commission, signed by Motorola vice president Arthur L. Reese, states that, "A cursory review of the test data supports the conclusion that the 890-940-mc band can provide good urban mobile coverage, with due consideration being given to selection of base station sites. There is also an indication that somewhat less satisfactory performance may be expected in heavily forested areas."

It is expected that Motorola's final engineering report will contain a detailed description of the tests conducted, a complete compilation of the recorded data, and the results obtained. In addition, a comprehensive engineering conclusion will be formulated, and a recommendation will be made with respect to Motorola Inc.'s pending petition based on this engineering project.

API radio committee meets

Microwave and split-channels highlighted the semi-annual meeting of the Central Committee on Radio Frequency of the API which was held in November at the Palmer House in Chicago.

It was decided by those in attendance that the executive committee and a selected group should go to the FCC offices and discuss the split-channel matter directly

communications • *Cont'd.*

with the commissioners, emphasizing the serious need for 20-kc separation in the 25-50-mc bands. In order that the petroleum industry will be able to make a forceful showing of need for the split-channels which have already been made available and those which might be made available in the future, a committee was appointed to prepare a report on the use of radio by the industry projected over the next 10 years. The chairmen of all the standing committees were named as members of this committee and Dr. Rust was appointed chairman of the eight-member group.

The commission's recent preliminary notice of hearing on microwave was discussed in great detail and it was decided that the administrative committee should meet in Washington in December to fully explore the matter and prepare the position which the Central Committee will take in the forthcoming hearings.

In other actions, the publication of a history of the National Petroleum Radio Frequency Coordinating Association, which was prepared by B. M. Shook, was approved. The FCC's request for 5-kc separation tests was referred to the engineering committee to study and make a recommendation. It was decided that H. A. Rhodes and R. L. Ransome will meet with manufacturers concerning the problem of coded tone squelch systems. An excellent paper entitled "Short Survey of Electric Wave Filters" was presented; Mason Collett and Lloyd Cook were authorized to frame a questionnaire to obtain the necessary information to provide documentary evidence of communication facilities provided by the petroleum industry; and Dr. R. D. Wyckoff of the Gulf Research & Development Co. was named as the recipient of the committee's Certificate of Merit for his accomplishments in the use of radio in geophysical operations.

GAS pipeline people

HAROLD E. VAUGHAN, formerly with Continental Oil Co., has joined Transcontinental Gas Pipe Line Corp., Houston, as assistant to the vice president for gas supply. Other promotions at Transco include JACK F. GALE to supervisor, gas purchases; N. W. LASSITER JR. to division superintendent in the compressor stations department; LEONARD F. COWLING, superintendent of compressor stations division headquartering at Atlanta; LAWRENCE P. SEATON JR., superintendent of the Linden, Ala., compressor station; WALTER H. BUCKINGHAM, senior engineer in Houston; and FRANK M. HAMILTON, succeeding Mr. Buckingham as superintendent of the Ellicott City, Md., station.

LEO C. GRAVIS has joined Trunkline Gas Co., Houston, as chief geologist. From this newly created post, Mr. Gravis will direct Trunkline's exploration activities—mainly in the Texas and Louisiana Gulf Coast areas. Another new member of the Trunkline staff is E. RUE THOMAS, Houston engineer and attorney, who has become superintendent of gas supply.

Harold Vaughan
Transco

A. H. Humble
CSI

William Durkin
Clark Bros.

Leo Gravis
Trunkline

WILLIAM T. DURKIN has been promoted to manager of the Pittsburgh office of Clark Bros. Co., Olean, N. Y., where he will be in charge of all application engineering for Clark reciprocating compressors.

Texas Eastern Transmission Corp., Shreveport, has appointed JOHN R. BLEWER as manager of community and stockholder relations and LEON M. SIPES as manager of publications.

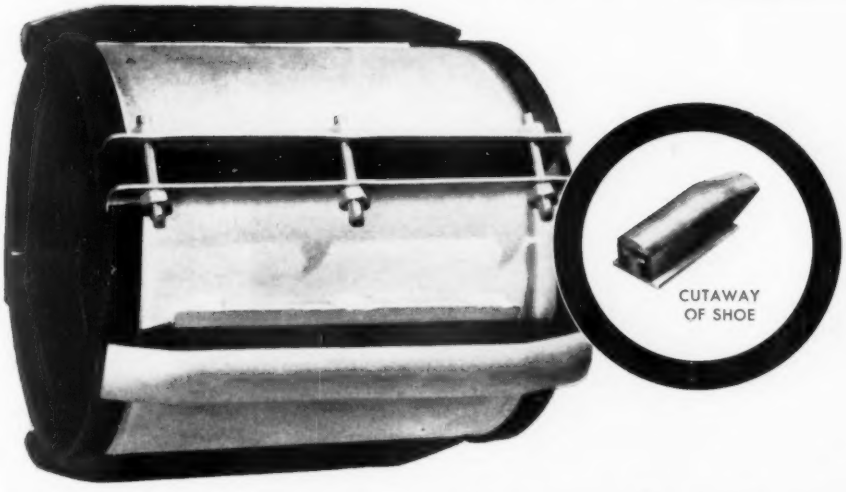
A. H. HUMBLE has joined the engineering staff of Corrosion Services Inc., Tulsa. He will design and install cathodic protection systems for pipelines, oil well casing and other buried structures. Mr. Humble was formerly with Gulf Refining Co.

JAMES MUIR, chairman and president of the Royal Bank of Canada, has been elected a director of Westcoast Transmission Co. Ltd., Calgary.

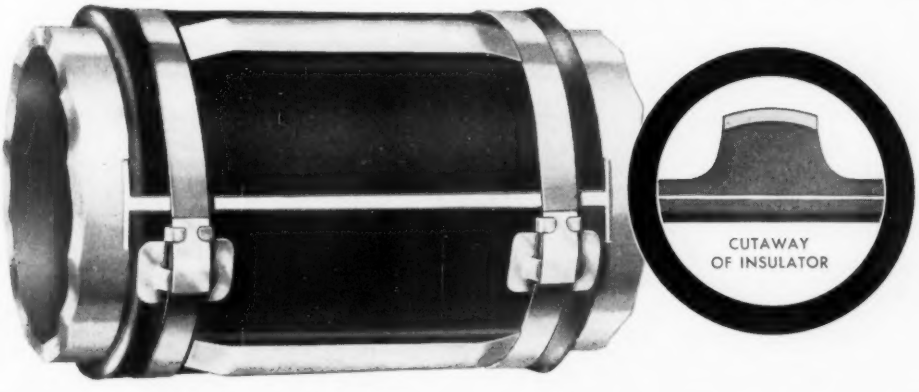
ROBERT C. BERRY has joined Trans-Canada Pipe Lines Ltd., Calgary, as treasurer.

In a realignment of personnel in the supply area of its system and operating headquarters in Kansas City, Mo., Panhandle Eastern Pipe Line Co. has made the following appointments: ROBERT B. HARKINS is assistant to the vice president; GEORGE B. MCCLELLAN is general manager of the production and supply division at Liberal, Kan.; FRANCIS J. MCELHATTON is general manager of the gathering and transmission division at Kansas City. The following four staff offices have been established: EVAN A. THOMAS, director of the office of resource planning, Liberal; WILLIAM C. MARRISS, director of the office of operational planning and budgeting; HERBERT H. DUFF, director of the office of industrial relations; and LESTER A. MUSSMAN, director of purchases and stores, all located in Kansas City. In the production and supply division, CLIFFORD R. HORN, assistant to the general manager, will direct the proration and reservoir engineering activities; PAUL L. DAVIS, manager of land and leasing; JAMES K. CURRY, manager of geology; RICHARD C. DIXON, manager of gas purchases. Other appointments in the gathering and transmission division are ERNEST O. NELSON, assistant general manager; JACK N. WHITE, superinten-

Model 55 Maloney Insulators for LARGE JOBS



Model 56 Maloney Insulators for Small Jobs



Maloney Insulators for *Every Job!*

Maloney Crossing Insulators for pipeline casing are exceptionally rugged, easy-to-install . . . *and adaptable to a wide range of pipe sizes and differentials.*

Because they are bonded metal-to-neoprene-to-metal, Maloney Insulators provide good shock-absorption, plus flexibility to compensate for pipe shifting.

Streamlined "sled-type" steel runners make for easy entry into the casing, and prevent hanging-up on casing welds as pipe is being run.

Model 55 Maloney Crossing Insulators, in all sizes through 36", are fitted with an extra-wide steel band for positive grip. Model 56, for pipe sizes through 12" with 2" nominal pipe size differential, are fastened to the carrier pipe with stainless steel bands. Both types offer greater dependability—greater protection against corrosion with high dielectric strength neoprene, and against physical damage with steel runners—than any other insulator on the market. Maloney Crossing Insulators are in use on most of the country's major pipelines.

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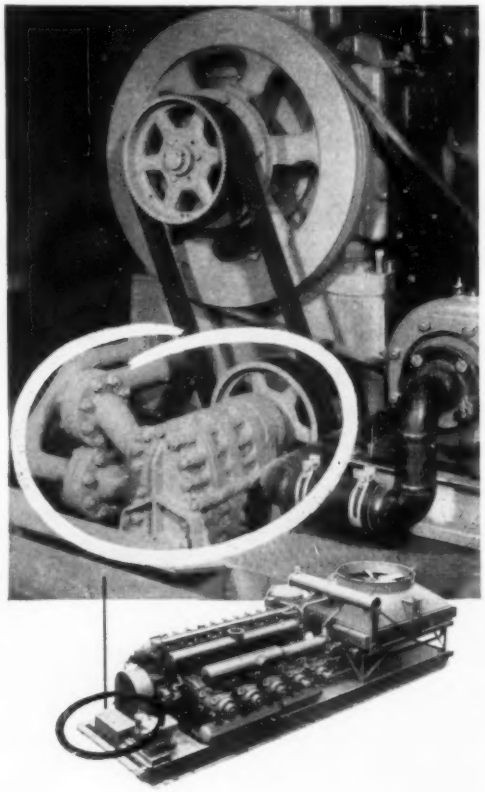

Berry drives give:

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- FLEXIBLE FAN LOCATION
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These are the reasons Clark Bros., Inc. standardized on Berry Hydraulic Drives to run the direct mounted radiator fans on their portable, skidmounted HMA-B Compressors. They replace conventional belt drive and jack shaft. Clark finds that versatile Berry Drives give them greater latitude in locating the radiator fan. Their customers like the infinitely variable fan speed that can be changed to fit the cooling requirement. Since input horsepower is only that necessary to operate the fan under any given temperature condition, there is a saving in power during cooler weather. Proved too, are lower upkeep costs and longer component life resulting from the cushioning effect of fluid power.

What does this mean to You?

The advantages of Berry Hydraulic Drives can be translated into lower costs on *your* power transfer requirements. Economical and easy to install, Berry Hydraulic Pump/Motor Drives assure smooth, sure, foolproof power at infinitely variable speeds. They are quiet running with maximum power efficiency. And, you can depend on Berry Hydraulic Pump/Motor Drives!

Send for this catalog now!
It's packed with simplified cutaways and data that tell you the "why" and "how" of Berry Hydraulic Drives.

BERRY DIVISION
OLIVER IRON AND STEEL CORPORATION
PITTSBURGH 19 PA.

BB-8

pipeline people • *Cont'd.*

dent of pipeline; KENNETH E. KALEN, superintendent of compressors; TIMOTHY J. KIRKPATRICK, superintendent of gas measurement; CECIL VAN GUNDY, superintendent of pressure control; STEPHEN A. BERGMAN, chief engineer; JAMES A. FOWLER, manager of communications; and GLENN L. BOWMAN, manager of transportation.

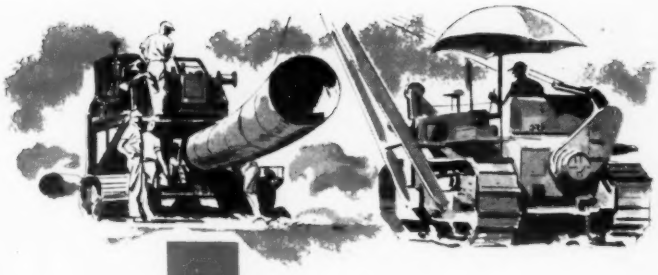
J. L. MAUTHE has been elected chairman of the board of the Youngstown (Ohio) Sheet & Tube Co. He is succeeded as president of the company by A. S. GLOSSBRENNER, former vice president of operations. WALTER E. WATSON, former first vice president, has been elected vice chairman of the board. Others elected are WILLIAM H. YECKLEY, formerly manager of steel operations to vice president of operations and FREDERICK M. MAYER, president of the Continental Supply Co. division, to vice president of the parent company.

Northern Natural Gas Co., Omaha, has named JAMES E. BECK process engineer in the compressor department. Prior to his promotion he was assistant superintendent of the company's Hobbs, N. M., facilities.

Recent marketing promotions in the Communications and Electronics division of Motorola Inc., Chicago, include the naming of ROBERT L. BORCHARDT as manager of the technical information center. He succeeds HAROLD A. JONES, director of sales of the C & E division. FREDERICK W. ALEXANDER has been promoted from technical editor to advertising manager. ROBERT E. NEWLIN has been named to the newly created post of product promotion supervisor. JOSEPH P. JATIS has been named manager of two-way radio service training.

R. L. Borchardt
Motorola

Joseph Jatis
Motorola



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• *Leakage Control Surveys by*

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are important SAFETY factors in distribution of natural gas to the Pacific Northwest . . .

"C" Type Surveys are the *safety* controls before, during and after actual conversion.

"V" Type Vegetation and Soil Surveys cover residential and rural areas.

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Over 650 gas companies in the U.S.A. and Canada use Heath Leakage Control Surveys to safeguard lives and property and to reduce unaccounted-for-gas losses.

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pipeline news • *Cont'd.*

from page 116

to the applicants, if they see fit again to redesign the proposed systems, to make a further showing as to the economic and financial aspects of the projects.

Examiner Purdue said that in passing upon the economic feasibility of a natural gas project, no fixed rule or formula can be applied arbitrarily; that the feasibility is dependent upon a number of factors, deficiencies of one being compensated by adequacies of another. Referring to the rejected applications, Mr. Purdue said "The fact remains that, in the presentation of the engineering witness for these four cities, there is one error of such consequence as to compel the conclusion that their applications cannot be granted." He said the witness based the system designs on a monthly mean low temperature of 28.8° while the FPC staff correctly pointed out that the needs of the systems are determined by the normal daily mean low temperatures. "For the daily low temperatures," the examiner said, "are bound to be considerably lower than the monthly average."

Producers continue court battle with Order 174-A

A court of appeals ruling that orders by the FPC prescribing regulations governing independent natural gas producers are not judicially reviewable is being fought in a petition filed in the U. S. Supreme Court.

Magnolia Petroleum, Ohio Oil, Superior Oil, and Wesley West seek review of judgments of the U. S. court of appeals for the fifth circuit which, in June of last year, dismissed their respective petitions for review of FPC order 174-A, which prescribed regulations governing independent producers under the Natural Gas Act.

Black Dog case fought by coal interests

Coal interests say that the FPC erred in approving Northern Natural Gas Co.'s plan to serve the Black Dog generating plant of Northern States Power Co., and are seeking a court review of the decision.

In seeking to obtain court approval of its contention that the

WHAT WILL YOUR PIPE LINES LOOK LIKE 10 YEARS FROM NOW ?

In case after case, lines protected with TAPECOAT have been dug up after more than 10 years of service *with no signs of deterioration on the pipe surfaces uncovered.* That's why TAPECOAT coal tar coating is specified by those who realize that continuing protection is the *first* consideration.

Since 1941, this quality coal tar coating in handy tape form has demonstrated its ability to withstand corrosion year after year, above and below ground, on pipe, pipe joints, couplings and other vulnerable surfaces.

Why gamble with "unknown" protection? By using TAPECOAT, you'll be sure to have the quality protection you need for long service life without costly maintenance and replacement.

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Evanston, Illinois

Natural Gas Act requires the FPC to apply "and use" control to prevent the burning of natural gas for boiler fuel purposes, the coal interests told the circuit court of appeals in the District of Columbia that the FPC was wrong because it failed to find "that this a a case where conservation of natural gas should be controlling."

High court rejects fair field price case

As a result of Supreme Court action, the Federal Power Commission must reconsider the Panhandle Eastern Pipe Line Co. case involving the fair field price formula for pricing Panhandle's own-produced gas.

The Supreme Court rejected Panhandle's petition for a rehearing on the court's Oct. 8, 1956 order which refused to review an appeals court decision which remanded the fair field price problem to the FPC.

In remanding this case to the FPC, the circuit court required the commission, as a matter of law, to credit all the revenues from gasoline extraction to the cost of transporting and selling for resale.

FPC pricing rules suggested by Oates

Suggested pricing rules for FPC use and an outline for remedial legislation were presented to members of the Independent Petroleum Association of America by James F. Oates Jr., head of Peoples Gas Light & Coke Co., Chicago.

His rule of thumb "which may be useful in dealing with the (pricing) problems immediately confronting the commission" within the limitations of existing law are:

"1. In the case of either existing or future contracts, prices negotiated at arm's length and in circumstances where competitive forces have provided a reasonable measure of equality in bargaining position, might well go into effect without FPC suspension. . . .

"2. If a producer who has agreed to a price seeks to increase it before the expiration of the contract term in any manner not provided for in the contract itself, such increase should normally be suspended upon filing; and, in the subsequent hearing the producer must establish that it is in the public interest for such change to be permitted. . . .

"3. The interstate pipeline buyer

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Model 6QS12
Ledeen **QUAD**
Actuator Mounted
on 24"x26" Plug Valve.

For Operation of High-pressure Plug and Ball Valves up to 36" in Size

A unique four-cylinder design provides direct-acting, balanced torque to the valve stem. The use of cylinders offers the basic construction advantages of simplicity and sturdiness, resulting in long and trouble-free life.

QUAD units provide auxiliary manual hydraulic operation. The gas and oil systems in all Ledeen QUADS are completely separate, eliminating any gas-oil interface.

Features

- **Balanced torque delivered to valve stem through four-cylinder construction.**
- **Gas and oil systems are entirely separate. No gas-oil interface.**
- **For periodic testing, detachable lever permits operation of actuator and controls without turning main valve.**
- **Easy field installation without modification of the plug valve.**
- **Available in wide range of torque capacities, and with a variety of control systems.**

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who has agreed to a contract price would ordinarily have no basis for seeking price decreases throughout the term, for the reason that the buyer is subject to regulation by the same agency that regulates the seller, the Federal Power Commission, and the problem of increased costs and other factors affecting the buyer's continued capacity to render service can be taken care of by appropriate regulatory policies followed by the commission. It should be accepted policy, it is admitted, that the pipeline rates should be based upon the price paid to the producers with the approval of the commission. . . .

"4. In the application of these principles, some recognition must be given to the differing position of the third party complainant, such as the utility company customers of the pipelines and a municipality or other representatives of consumer groups. Not having been a party to the contract, negotiation, he must be accorded an opportunity to seek (1) suspension of rate increases, and (2) decreases in rates which have become finally effective. . . .

"5. The Federal Power Commission, in exercising its discretion to move on its own motion to suspend rate changes or to investigate rates already in effect, should be guided by considerations similar to those applicable to third party complainants. Such considerations can, of course, serve only as general guides to action. . . . "

In regard to amendatory legislation, Mr. Oates made the following general points:

"1. The statute shall embody a conclusive presumption that the specific prices of all arm's-length contracts concluded on or before June 7, 1954, shall be deemed to be just and reasonable within the meaning of the legal requirements. This irrebuttable presumption shall extend to prices resulting from reasonable step escalation clauses, and tax adjustment or similar clauses picking up identifiable increases. It shall not extend to the spiral or the automatic most-favored-nation escalators which leave the price increase completely uncertain and beyond control of the immediate parties.

"2. All arm's-length contracts concluded after June 7, 1954, shall be filed promptly with the FPC and notice thereof given to all parties in interest. . . . Escalation clauses of the automatic and uncontrolled type shall be banned.

"3. If an objection is made by a party in interest to a new contract, or in the case of a filed price increase resulting from an automatic and uncontrolled escalation clause under Paragraph 1, the FPC shall, after hearing, apply a statutory standard of just and reasonable founded upon the principle that natural gas is a commodity and that its value is to be recognized primarily in terms of its reasonable market price rather than upon any conventional public utility concept and not upon the basis or a rate of return on original cost. . . .

"4. No provision in any contract, old or new, shall be effective which purports to give a seller an option to terminate performance of gas service as provided by a contract prior to the expiration of its terms because of dissatisfaction with the advent or operation of regulation. . . .

"5. Since a pipeline cannot contract with itself, the rate treatment to be given to pipeline-produced gas shall rest upon the same principles

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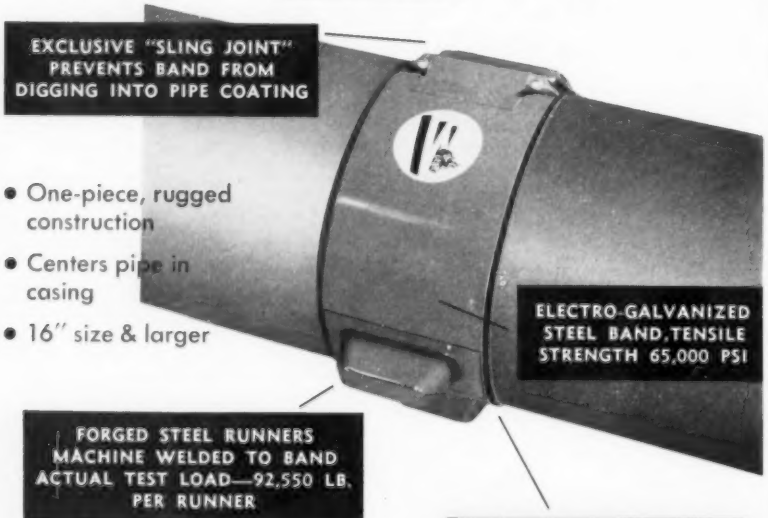
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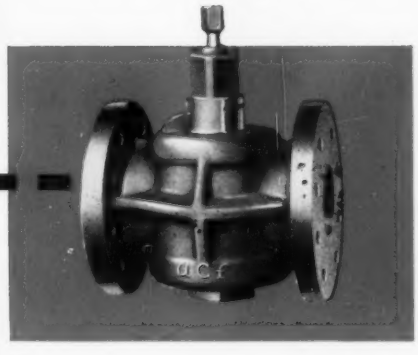
Hot Tapping

through ACF Round Port Lubricated Plug Valves



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respecting reasonable market price as those described above with respect to purchasers under new contracts from independent producers.

"6. The approved price paid to the producer by the pipeline company shall be entitled to inclusion, without question or contest, in all subsequently filed rates of such pipeline company.

"7. The application of the certificating, reporting and accounting provisions of the Act shall be reduced to the barest minimum required to effect the regulatory scheme outlined above."

Transcontinental places $20 million debenture

An issue of $20 million 4 per cent debentures, due this year, has been sold by Transcontinental Gas Pipe Line Corp. to a group of insurance companies, according to J. F. Burton, financial vice president of the Houston transmission company.

Proceeds from the sale will be used to retire all presently outstanding bank loans previously arranged to provide funds for construction. In May 1956, Transco sold an issue of $40 million of 3⅞ per cent first mortgage pipeline bonds, and at the same time arranged for the sale of the $20 million of 4 per cent debentures. In October, the company sold an additional 441,250 shares of common stock to shareholders. All three transactions were part of its construction financing program.

With the completion of the 1956 scheduled financing, Transco has outstanding $229,446,000 of long-term debt, $41,950,000 of preferred stock, and 7,501,250 shares of common stock.

Tennessee Gas has oil producer

Tennessee Gas Transmission Co., Houston, has an indicated wildcat discovery of significance in its State A. A. Kemnitz "A" No. 1 in Lea county, N. M., according to Ralph Graham, senior vice president of the company.

Two drill stem tests have been made in the Permo-Penn lime, with the following results: at 10,640-10,731 ft, the well flowed 13 bbl of oil and no water in 16 minutes on a 1-in. choke; and when pinched back to a ⅝-in. choke, flowed 157 bbl of oil and no water in two hours. At 10,737-10,763 ft, it flowed 27 bbl of oil and no water in 20 minutes on a 1-in. choke, and when pinched back to a ½-in. choke, flowed 155 bbl of oil and no water in 4 hr.

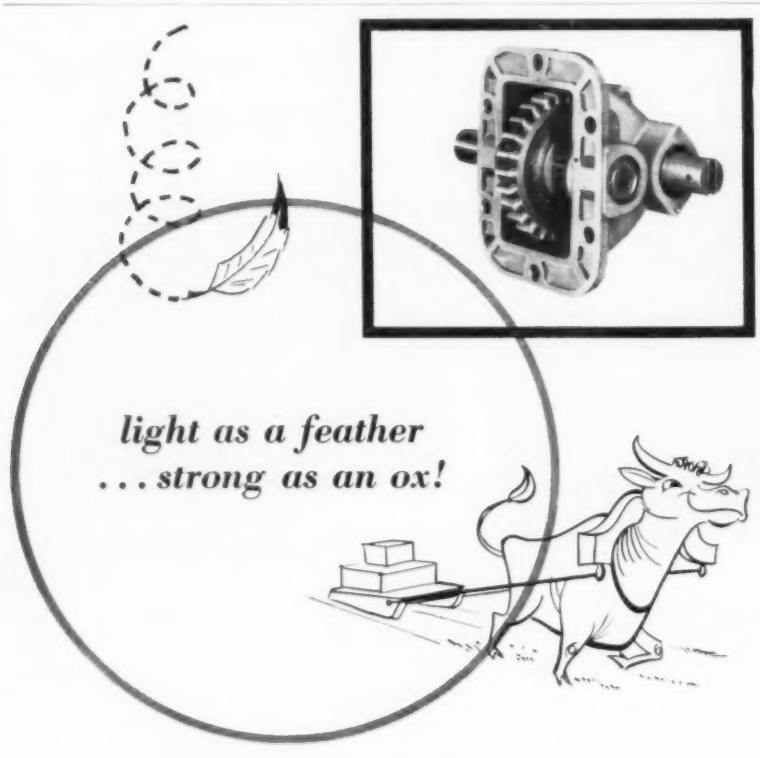
Drilling is continuing to projected depth of 11,500 ft. The company has staked a second well one mile west of the indicated discovery.

The wells are on what was until recently 1360 acres of net company leases in the area. However, the company has added 480 acres in the immediate vicinity with its successful bid of $504,000 at public sale.

Producers helped by FPC regulation changes

Two orders have been issued by the FPC which amend regulations under the Natural Gas Act to enlarge certificate exemptions and to permit temporary service by independent producers.

Order 192, Docket No. R-151, amends the present regulations



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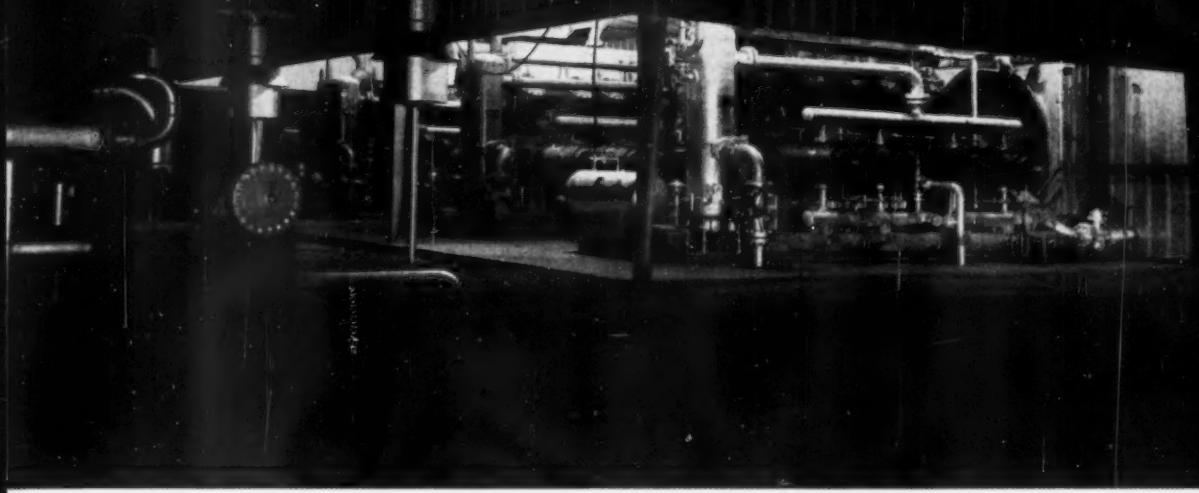

NATURAL GAS AND OIL COMPANY'S SLIGO FIELD STATION—equipped with three Beaird-Ingersoll-Rand 10SVG 550 h.p. packaged compressors, Young Radiators with lubricating oil coolers, gas coolers and all necessary controls. Other sizes 110 to 660 h.p.

Natural Gas and Oil Company has twice expanded this compressor station in Sligo Field, Louisiana. Originally it was equipped with a single Beaird-Ingersoll-Rand 10SVG 550 h.p. compressor. In designing the station the engineers provided the space and piping to accommodate units that would be added on as needed. Now picking up gas from 24 low pressure wells at 650 psig. the station is boosting from 40 mmcfd to 50 mmcfd to transmission lines at 1050 psig. The last unit installed in August of this year will enable the station to follow the pressure on down to 200 psig. without change from single-stage operation. At this point in production the units will be changed in the field to two-stage operation. And finally as the field nears depletion, one or two of the compressor plants may be transferred as a complete package to another site, leaving the remaining plant to complete production.

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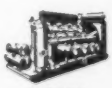

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which exempt from FPC certificate requirements certain temporary acts and operations necessary to assure the maintenance of adequate service where interruption or serious curtailment of service exists or is threatened.

The amendment broadens this provision to exempt natural gas service for the purpose of drilling gas or oil wells and for use in testing or purging new pipeline facilities. The commission said that operation of facilities for these purposes is of temporary or limited duration, and that certification is not necessary.

The other order (No. 198, Docket R-151) promulgates two new sections of the regulations which provide that in the event of an emergency an independent natural gas producer may institute temporary service and continue it pending final action on his certificate application.

Gas-for-irrigation law ruled unconstitutional

A 1955 legislative act requiring natural gas producers to sell gas to farmers for irrigation purposes was held unconstitutional by the Oklahoma supreme court.

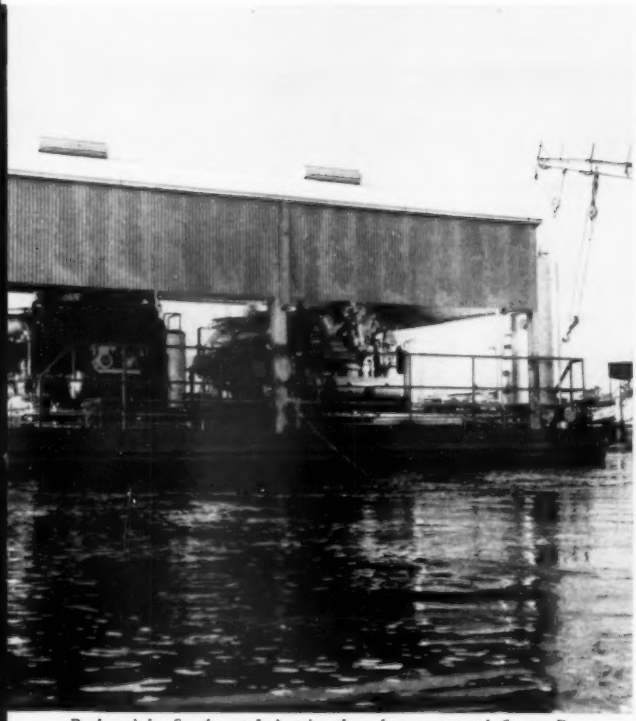
By a 6-3 decision, the court held that the requirement would amount to taking property without due process of law. The act, passed principally for farmers in the Panhandle area, was attacked by the Phillips Petroleum Co.

The act was passed after farmers, on whose land gas leases were operated, demanded that Phillips and other producers sell part of the gas back to them for use as power in irrigating land because agriculture is a basic part of Oklahoma life and sale of gas for irrigation could be regulated to that extent.

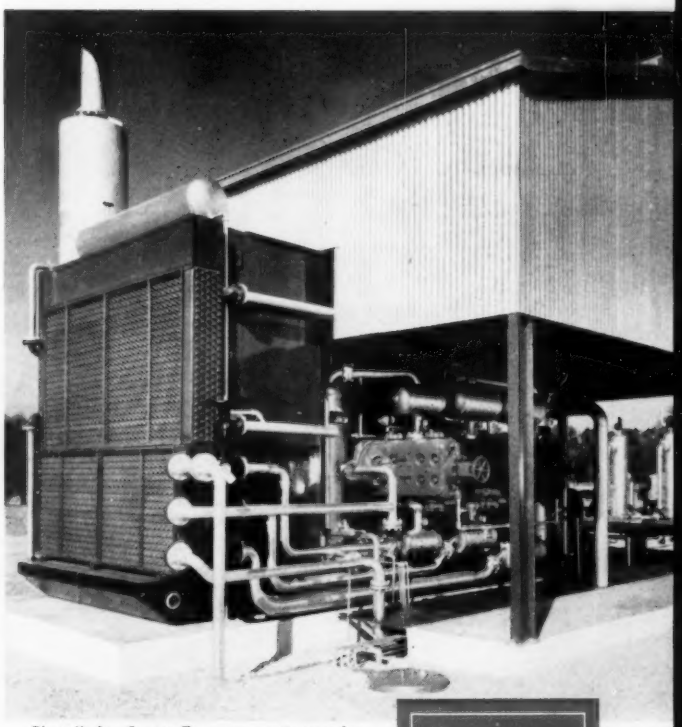
Liberalized depreciation method taken to court

A petition filed in the U. S. Court of Appeals for the District of Columbia circuit seeking review of the FPC order which affirmed a presiding examiner's opinion on accounting for federal income tax accruals under the liberalized depreciation method.

The examiner said that gas companies which elect to use the liberalized depreciation methods allowed



Packaged by Southwest Industries these barge mounted Cooper-Bessemer GMXD's handle natural gas compression at this Louisiana Gulf Coast installation of The California Company.



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under 1954 revisions to the Internal Revenue Code may do so but should be required to account for and report to the FPC the amounts accumulated for federal income tax purposes.

The petition by the City of Lexington, Ky., and 15 other Kentucky cities, complains that the commission's action permits depreciation to be booked on a "straight line" basis for rate purposes but federal income taxes to be paid on a liberalized depreciation basis, so that rates will include compensation for more than the companies actually pay as such taxes. The petition claims that this is not the intention of the relevant section (167) of the Internal Revenue Code for 1954, is contrary to regulatory precedents, and will result in the creation of gigantic permanent reserves.

FPC okays NGPL plan to build 350-mile line

The FPC has authorized Natural Gas Pipeline Co. of America, Chicago, to construct a 350-mile line to enable it to tap reserves in northern Texas and southwestern Oklahoma and to purchase natural gas for transportation and ultimate delivery to the Chicago area (Dockets G-4280 et al and Opinion 299).

The commission at the same time issued a certificate to Lone Star Gas Co., Dallas, authorizing it to sell a maximum of 100 MMcf/day to NGPL at a point in Stevens county, Okla. However, it denied Lone Star's proposal to build a 230-mile line to make this gas available to Natural at Fritch, Texas. Natural's proposed line will intersect Lone Star's system at the point in Stevens county.

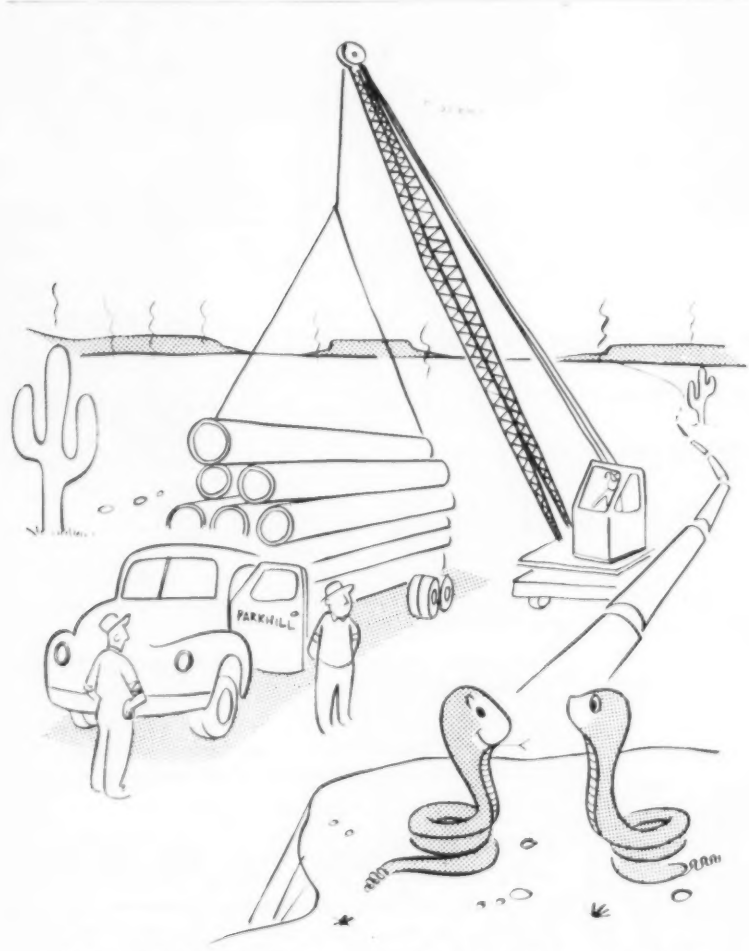
The FPC's order also grants certificates to a group of independent producers authorizing them to sell gas to Natural from fields in Jack and Wise counties, Texas. These deliveries initially will average 78 MMcf of gas per day. The producers are Sunray Mid-Continent Oil Co. and Warren Petroleum Corp., Both of Tulsa, and Oil Drilling Inc. et al of Houston.

Natural's proposed 350-mile line will extend from Wise county to a connection with its existing system at Fritch. Natural plans to obtain additional gas from points along the route of the new line, which will have a capacity of 240 MMcf/day. Estimated cost is $28.4 million plus another $3.5 million for production and gathering facilities.

The commission's order provides that if Lone Star accepts the certificate authorizing the sale of gas to Natural in Oklahoma, Natural must file a certificate application within 90 days requesting FPC authorization to build the necessary facilities to increase its present system sales capacity to transport the Lone Star gas.

Last February, an FPC presiding examiner filed a decision granting certificates to Natural and the independent producers, but denying Lone Star's competing application. The proceedings subsequently were reopened for further hearings, during which NGPL agreed to purchase gas from Lone Star at either Fritch or Stevens county, as well as from the independent producers as it had proposed originally. Lone Star, however, proposed to supply gas to Natural at Fritch only.

The commission said that the prospect of Lone Star's proposal alone for meeting Natural's long-term supply requirements is "markedly inferior" to that of Natural and its suppliers. The FPC also pointed out that in addi-



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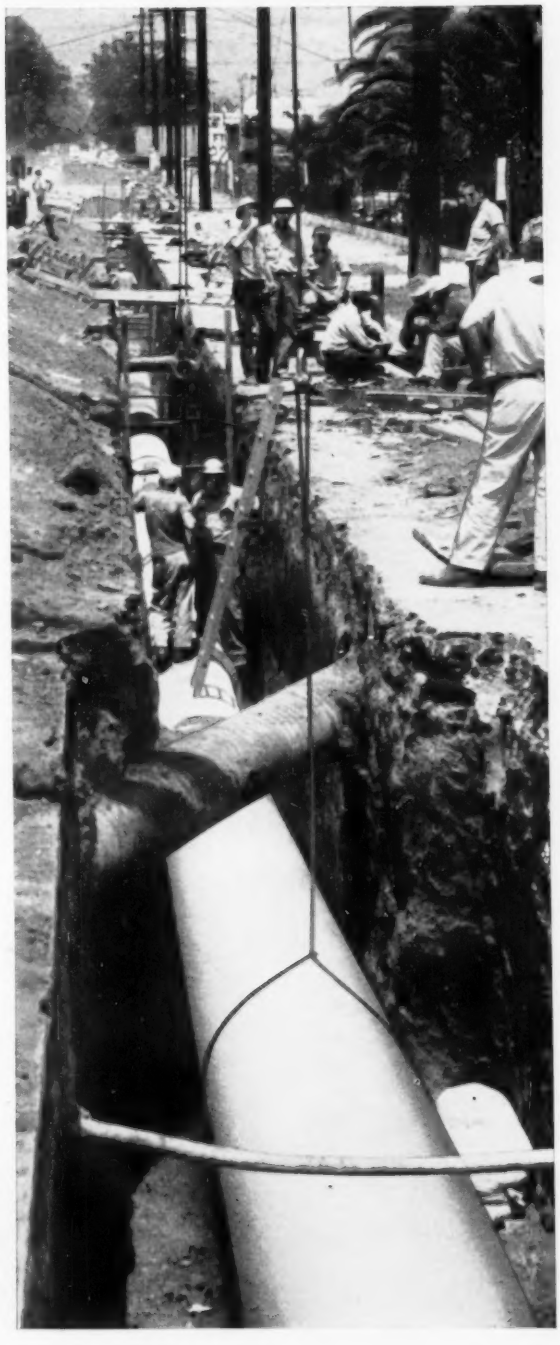

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tion to the fact that Lone Star's plans for supplying volumes of gas above those initially proposed are still relatively general and uncertain, it is in a position to offer gas to Natural only because of an immediate and relatively short-term surplus on its system. The commission said that while this may support the sale of the initial volumes, it does not justify the construction of the facilities to Fritch.

Pointing to evidence presented by Natural at the reopened hearing on the present and growing gas needs of the Chicago area, the commission said that Natural's proposed pipeline is designed to traverse highly productive gas areas which have uncommitted reserves of "such magnitude" as to justify the conclusion that Natural will be able to contract for substantial additional supplies in the future. These reserves offer exceptional opportunity for substantial improvements in Natural's long-term gas supply from these sources, the FPC added.

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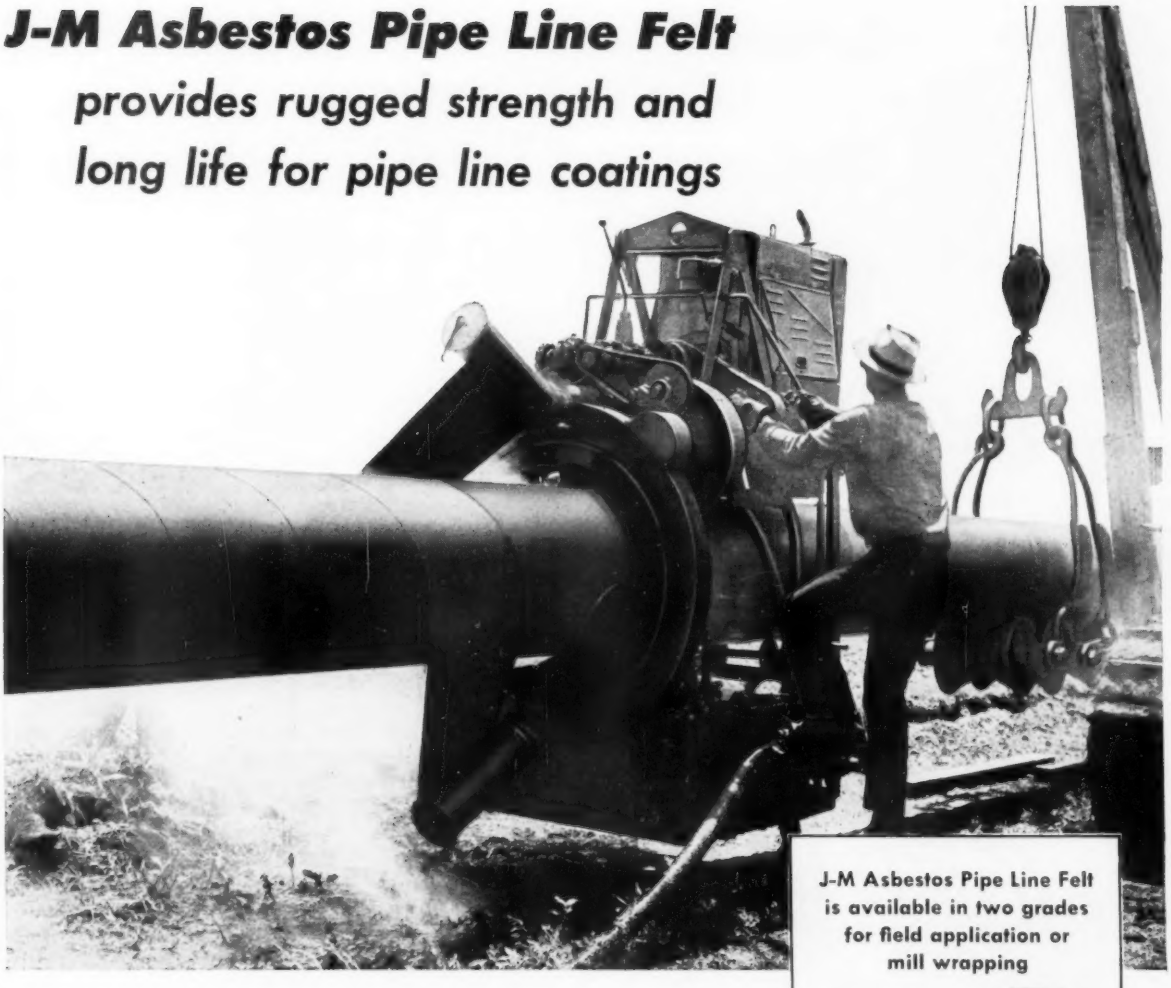

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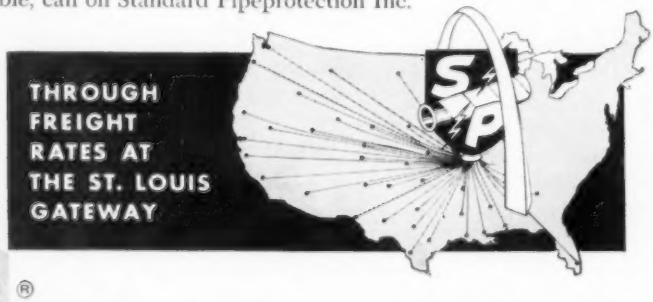

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pipeline news • *Cont'd.*

The commission determined that the sale of gas by Lone Star to Natural at a point in Stevens county would more fully satisfy "the requirements of public convenience and necessity" than the single project of Natural and its suppliers.

The commission also concluded that under the circumstances in this case no price condition should be imposed in the certificates issued to the producers. The price, under the amendments to the contracts introduced in the reopened proceedings, is 13.9 cents/Mcf for the initial volume of gas.

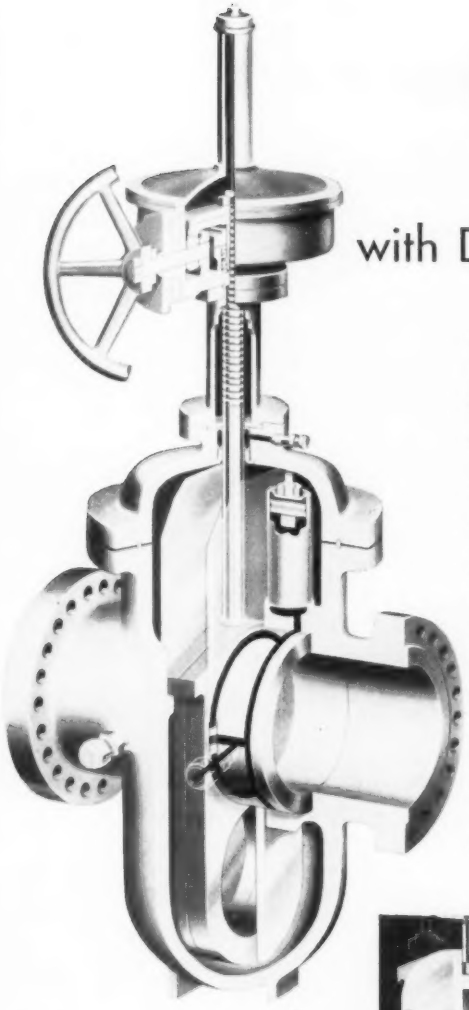
Trans-Canada makes major river crossing

A 260-ft section of 34-in. pipe was pulled across the Assiniboine river near Miniota, Man., Canada, late in November, marking installation of the first half of two dual crossings of the river to be made by the Trans-Canada pipeline from Alberta to eastern Canada.

Second crossing of the river at Miniota will be followed by dual crossings of the same river near Portage La Prairie in Manitoba. Contractor for both river crossings is Marine Pipeline & Dredging Ltd., Vancouver.

At the Miniota crossing, the general work area was set up on the west side of the river. Here the joints were welded both inside and out, the pipe was cleaned, primed and given double coats of bitumastic enamel, fiberglass and kraft paper. The pipe was wrapped in shiplap rock shields, and the whole encased in 30 600,000-lb concrete river weights. Between the weights wooden slats were wrapped around the pipe for protection. Weight of the pipe as it went into the river was 1100 lb/ft.

The pipe was lowered by three sideboom tractors on to dollies which ran on rails in the ditch to the water's edge. Air-tight floats were attached to give temporary buoyancy and the pipe then was winched across the 200-ft expanse of water. The ditch ranged from 10 to 15 ft deep in the bed of the river. Including approaches, overall length of the crossing was approximately 1300 ft.



NEW ADVANTAGES "GO ON THE LINE"

with DARLING-McEVOY Conduit Valves

Compare these features with *any* other pipe line gate valve:

1. EVERY CLOSURE LEAK-PROOF. No forcing. Positive, automatic self-sealing between seats and gate and seats and body by means of sealing compound.

2. NON-DIRECTIONAL. Flow may be in either direction.

3. TWIN SEALANT RESERVOIRS. One for each port. Sealant feeds automatically to downstream side only.

4. NEGLIGIBLE SERVICING. Leak-proof closure requires very little sealant. Reservoir capacity ample for a great many operations.

5. SMOOTH, FULL FLOW. No impediments. No turbulence. No pockets to collect sediment.

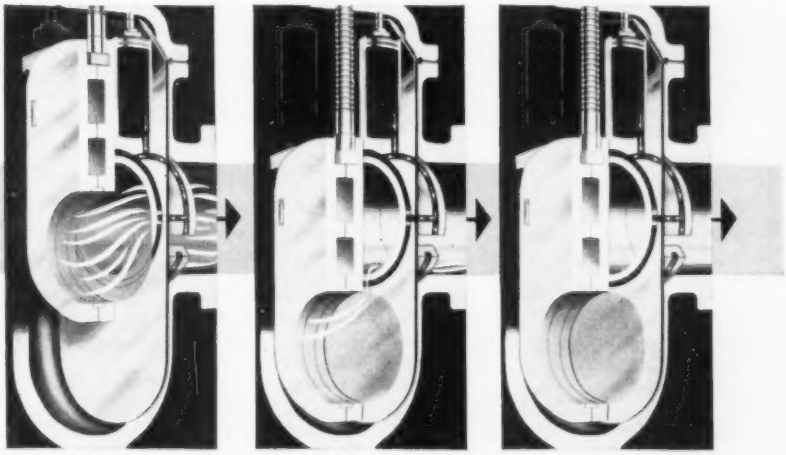
6. REPACKING UNDER PRESSURE. Construction permits replacement of stem packing media with valve wide open under full line pressure.

7. EXCEPTIONAL PERFORMANCE AND LIFE. Self-aligning gates. No wedging. Non-distorting seats, protected when valve is open or closed.

Darling-McEvoy conduit valves, made in 8″ and larger sizes, are fully field proved and are now operating continuously on various major lines. For complete information on the self-sealing feature and many other advantages of this unique valve, ask for Bulletin 5402.

Above: *Cutaway showing heavy, self-aligning gate and parallel seat assembly, with one of the two sealing systems indicated.*

Right: *Diagrams of closure action on downstream side of gate.*



APPROACHING CLOSURE... *No loss of sealant as sealing groove in seat is disconnected from reservoir until gate is fully closed.*

CLOSED... *Jumper in gate now permits differential pressure to feed sealant into seat groove to check any remaining flow.*

AUTOMATICALLY SEALED. *Pressures again in balance. Tightness established. No additional sealant used until again needed.*

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DARLING VALVE & MANUFACTURING COMPANY

Williamsport 26, Pa.

Manufactured in Canada by Sandilands Valve Manufacturing Co., Ltd., Galt 19, Ontario

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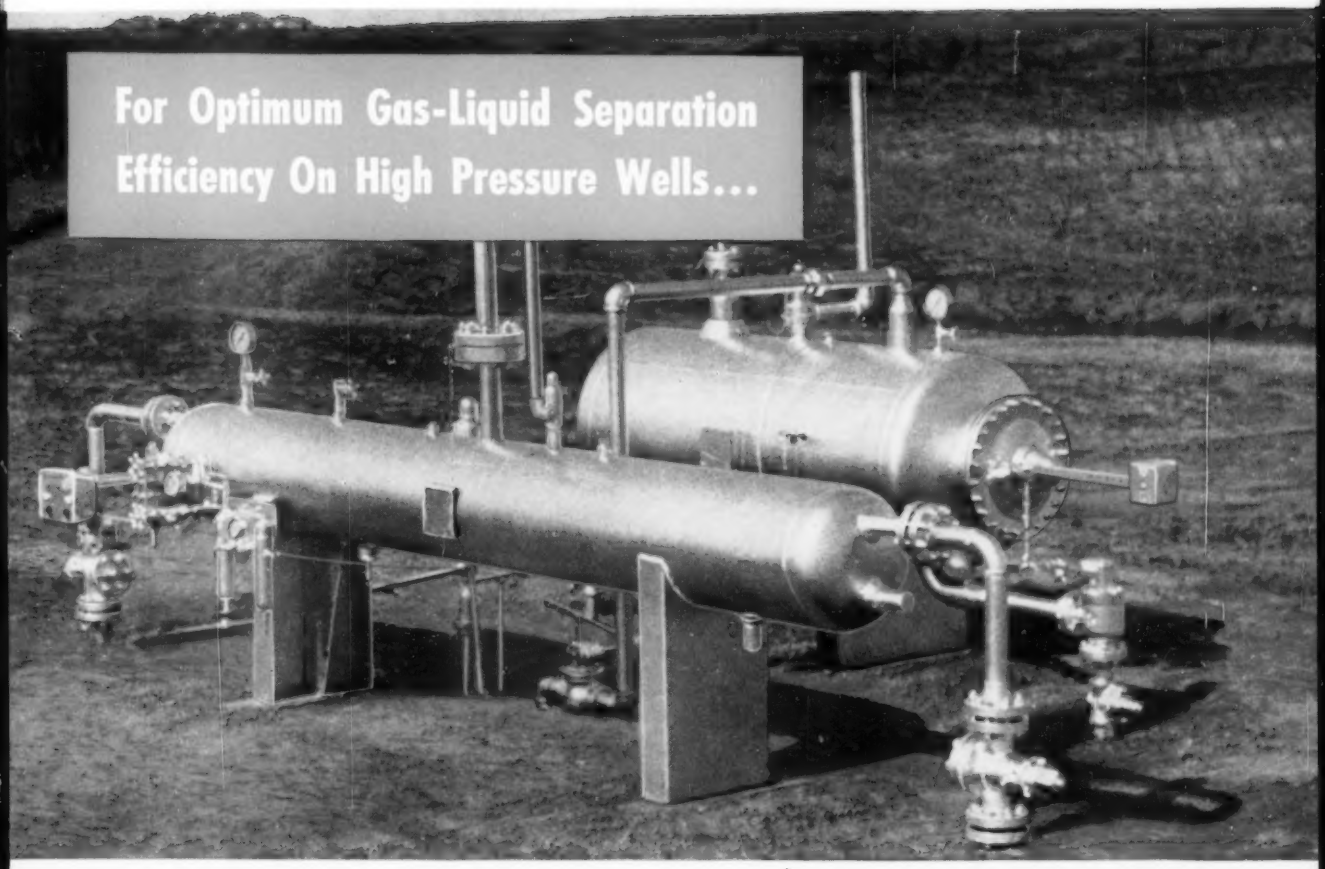

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The BS&B Model DC Separator!

Because of its exclusive internal design incorporating a large gas-liquid separation chamber, a large liquid collecting and surge chamber, and a highly efficient mist extraction section all within its single horizontal cylinder, the Model DC Separator gives optimum separation efficiency on high pressure wellstreams.

Take the installation pictured above, for example. This Model DC Separator (foreground) is teamed up with a Model H Low Pressure Separator to form a two-stage hookup for processing the condensate-laden gas produced on a Kansas lease.

High gravity distillate is removed from the wellstream by the Model DC at approximately 60° F., and is then transferred to the Model H for further stabilization of the light ends at a reduced pressure of approximately 110 psi. Sales gas goes to the gathering line at 1000 psi, and condensate to the stock tanks at a pressure of 16 oz.

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- ✔ High Separation Efficiencies
- ✔ Proven BS&B Controls
- ✔ Easy Serviceability
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